बावीसावी
आंतरराष्ट्रीय आंतरविद्याशाखीय परिषद, पुणे

देश आणि विदेशातील विविध क्षेत्रातील स्त्री कर्तृत्वाचे योगदान
भाग १

संपादक
डॉ.स्नेहल तावरे
डॉ. शिवलिंग मेनकुदळे
डॉ. संजय नगरकर
डॉ. सविता पाटील

स्नेहवर्धन प्रकाशन
पुणे

ও स्नेहवर्धन प्रकाशन : क्र. १२९०

ও देश आणि विदेशातील विविध क्षेत्रातील स्त्री कर्तृत्वाचे योगदान
भाग - १
(समीक्षा - संदर्भ)

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विश्वाची मूलाधार असलेल्या,
कोणत्याही परिस्थितीला खंबीरपणे
तोंड देणाऱ्या, अष्टावधानी असलेल्या
समस्त स्त्री शक्तीला
आदरपूर्वक सस्नेह अर्पण...

- डॉ.स्नेहल तावरे
- डॉ. शिवलिंग मेनकुदळे
- डॉ. संजय नगरकर
- डॉ. सविता पाटील

अनुक्रमणिका
भाग - १

अशा प्रतिकुल परिस्थितीतही सावित्रीबाई पालकांच्या भेटी घेत असे व त्यांना शिक्षणाचे महत्त्व पटवून देत. तत्कालीन सावित्रीबाईंचे अध्यापन कार्य व तळमळ लक्षात घेता आजच्या पोटभरू, राजकारणी, स्वार्थी व वरिष्ठांची हांजीहांजी करणाऱ्या शिक्षकांची कीव येते. १५ मे १८१८ रोजी महारवाड्यात मुलामुलींसाठी शाळा सुरू केली. १८४८ ते १८५९ या कालखंडात फुले दांपत्यांनी पुणे व पुणे परिसरात २० शाळा काढल्या व त्या उत्तमरित्या चालविल्या. महात्मा ज्योतिराव फुले यांच्या समवेत सावित्रीबाईंनी शैक्षणिक कार्यात मोलाचे योगदान दिले. स्त्री शिक्षणाशिवाय स्त्रियांचा उद्धार नाही. स्त्रीचे कुटुंबातील व समाजातील स्थान लक्षात घेवून स्त्रियांनी शिक्षण देवून त्यांना ज्ञानी करण्यावर भर दिला. 'जिच्या हाती पाळण्याची दोरी ती जगास उद्धारी' असे स्त्रीचे महत्त्व होते. जोपर्यंत समाज स्त्रीचा सन्मान करीत नाही, तिला प्रतिष्ठा मिळून देत नाही तो पर्यंत कुठलाही समाज कधीही प्रगती करू शकत नाही. हे दीडशे वर्षापूर्वी सावित्रीबाईने सांगितले होते. तेव्हाचे शिक्षण मंडळाचे अध्यक्ष ना. जॉन बॉर्डन यांनी १८५१ मध्ये शाळेला भेट दिली तेव्हा त्यांनी म्हटले होते. 'ज्योतिबांपेक्षा त्यांच्या पत्नीचे कौतुक करावे तेवढे थोडेच आहे' यावरून त्यांचे ऐतिहासिक कार्य दिसून येते.

सन १८५२ मध्ये विश्रामबागवाड्यात ज्योतिरावांच्या स्त्री-शिक्षण कार्याबद्दल ब्रिटिश सरकारकडून शाल व श्रीफळ देउन त्यांचा गौरव करण्यात आला. त्यावेळी सावित्रीबाईंनाही आनंद होणे स्वाभाविक होते. त्यावेळी सावित्रीबाईंचाही गौरव झाला. ज्योतिराव सावित्रीबाईस म्हणाले, ''हा गौरव तुझाच आहे. मी शाळा स्थापण्यास कारणमात्र आहे, पण त्या शाळा तू अनेक संकटांशी संघर्ष करुन यशस्वीरित्या चालविल्या त्याचा मला अभिमान वाटतो.''

संदर्भ ग्रंथ

१. सावित्रीबाई फुले कला आणि कर्तृत्व - महाराष्ट्र राज्य साहित्य आणि संस्कृती मंडळ
२. नरके हरी (संपा) - आम्ही पाहिलेले फुले - फुले प्रकाशन समिती, मुंबई १९९८
३. गर्गे स.मा. - सामाजिक चळवळी काल, आज व उद्या - रूपा नागोराव कुंभार, प्रबोधन प्रकाशन, लातूर १९९४
४. पाटील पंढरीनाथ सीताराम - महात्मा ज्योतिराव फुले चरित्र - रघुवंश प्रकाशन, पुणे २००८
५. प्रा.डॉ. सिद्राम खोत - सलाम स्त्रीशक्ती - अरिहंत पब्लिकेशन, पुणे
६. डॉ. एस.एस. गागळ - भारतीय इतिहासातील स्त्रिया व स्त्रीजीवन- कैलास पब्लिकेशन, औरंगाबाद.

स्त्रीदास्य मुक्तीच्या आद्यप्रणेत्या : सावित्रीबाई फुले

- डॉ. भूषण फडतरे

१९ वे शतक हे भारतीयांच्या दृष्टीने प्रबोधनाचे शतक म्हणून ओळखले जाते. मध्ययुगीन काळातील पारंपारिक मूल्य नष्ट होऊन आधुनिकतेची कास धरणारी मानवतावादी, बुद्धिप्रामाण्यवादी, वैज्ञानिक दृष्टिकोन, स्वातंत्र्य, समता, बंधुता अशी आधुनिक मूल्य येथे रूजू लागली. त्याचाच एक भाग म्हणजे सामाजिक व धार्मिक सुधारणा चळवळीमधील विषेत: स्त्री सुधारणा चळवळ ही परिणाम कारक ठरली आहे. बाल विवाह, जरठकुमारी विवाह, सतिप्रथा, केशवपन, विधवाविवाहबंदी, भ्रूणहत्या, स्त्री शिक्षणबंदी अशा रूढींना वाचा फोडण्याचे कार्य पुरुषांप्रमाणेच स्त्रियांनी देखील केलेले आहे. त्यामध्ये सावित्रीबाई फुले, पंडिता रमाबाई, ताराबाई शिंदे, रमाबाई रानडे, काशिबाई कानिटकर, अवंतिकाबाई गोखले, मुक्ता साळवे अशा अनेक स्त्रिया प्रबोधनाच्या दृष्टीने उल्लेखनीय आहेत.

स्त्रीदास्यमुक्तीच्या आद्य प्रणेत्या : सावित्रीबाई फुले ह्या स्त्री व अस्पृश्य वर्गाच्या शिक्षणाबरोबरच सामाजिक सुधारणेच्या कार्यातही सहभागी होत्या. सावित्रीबाईंनी स्त्रियांची सुधारणा करण्यासाठी महिला सेवा मंडळाची स्थापना केली. या संस्थेच्या अध्यक्षा पुण्याचे कलेक्टर ह्यांची पत्नी मिसेस इ.सी.जोन्स होत्या. तर सेक्रेटरी सावित्रीबाई फुले होत्या. या सेवा मंडळामार्फत १३ जानेवारी १८५२ रोजी मिसेस जोन्स यांच्या अध्यक्षतेखाली सार्वजनिक तिळगूळ समारंभ आयोजित करण्यासंदर्भात छापील पत्रिका काढली होती. समारंभास सर्व जातिधर्मातील स्त्रिया एकत्र बसतील व सर्वांनी एकमेकींना हळदीकुंकू लावून तिळगूळ वाटण्यात येई. या अर्थाचा मजकूर होता. या समारंभामध्ये प्रचंड संख्येने स्त्रियांनी सहभाग घेतल्याने जातिभेद निर्मूलन चळवळीस एका अर्थाने सुरूवात झाली होती.[१]

समाजात बाल विवाह प्रथा प्रचलित होती. पतीच्या निधनानंतर पत्नीला विधवापण येणे म्हणजे नरक यातना सोसण्यासारखेच होते. तेव्हा अशा विधवांचा पुनर्विवाह होण्यासाठी अनेकांनी पुढाकार घेतला. जोतिराव व सावित्रीबाई फुले यांच्या साक्षीने सन १८६४ मध्ये पुण्यातील गोखले बागेत सारस्वत जातीतील

विधवेचा पुनर्विवाह झाला.१३ विधवांची स्थिती ही अमेरिकेतील निग्रोंपेक्षाही वाईट होती. सर्व सुखांपासून त्यांना दूर ठेवले जात होते. एवढेच नव्हे तर तिला गुन्हेगारापेक्षाही व जनावरांपेक्षाही वाईट वागणूक दिली जात होती. तारुण्यातील एखादी विधवा वासनेच्या आहारी गेली किंवा तिची फसवणूक करून शारीरिक संबंध आला तर ती गरोदर राहत होती. अशा अवस्थेत ती बाळाचा जीव घेत व स्वत:ही जीव देत. असे करण्याशिवाय तिला गत्यंतरच नव्हते. अशा स्त्रियांचा व बाळाचा जीव वाचण्यासाठी फुले दाम्पत्याने आपल्या स्वत:च्या घरात बालहत्या प्रतिबंधकगृह सुरू (१८६३) केले. हे गृह सुरू होण्यास पुण्यातील काशीबाईच्या खटल्याचे कारण होते. जोतिरावांचे मित्र गोवंडे यांच्या घरी काशीबाई ही ब्राह्मण विधवा स्वयंपाक करण्याचे काम करीत होती. शेजारच्या शास्त्रीबुवाने तिला फसविले. त्यातून ती गरोदर राहिली. गर्भपाताचे सर्व प्रयत्न फसल्यानंतर तिने बदनामीच्या भीतीने अर्भकाची हत्या केली. तिच्यावर खटला भरला. तिला शिक्षा झाली. अशा स्त्रियांना आधार देण्यासाठी फुले दाम्पत्यांनी बालहत्या प्रतिबंधकगृह सुरू केले. आपल्या घरातील बालहत्या प्रतिबंधक गृहातील ३५ ब्राह्मण विधवा स्त्रियांचे बाळंतपण स्वत: सावित्रीबाई फुलेंनी केलेली आहेत. १४ फुले दाम्पत्याने बालहत्या प्रतिबंधक गृहातील एका विधवेच्या मुलाला म्हणजेच यशवंतला दत्तक घेतले. पुढे त्याला डॉक्टर केले.

विधवा स्त्रियांना विद्रूप करण्यासाठी केशवपन केले जात होते. इच्छेशिवाय त्यांना बळजबरीने न्हाव्यापुढे बसवून केशवपन करावे लागत होते. ही प्रथा बंद करण्यासाठी न्हाव्यांचा संप घडवून आणण्याची कल्पना सावित्रीबाईंची होती. सन १८६५ मध्ये पुण्याजवळील तळेगाव ढमढेरे येथे न्हाव्यांचा संप झाला होता. असा न्हाव्यांचा संप देशातील पहिला संप ठरला आहे.[१५] या संपाने अनेक विधवांची केशवपनाच्या संकटातून मुक्तता झाली. या कार्याचे प्रतिबिंब पुढे ह.ना. आपटे यांच्या सन १८९६ मध्ये लिहिलेल्या 'पण लक्षात कोण घेतो' या कादंबरीतून दिसून आले आहे.

सतिप्रथा ही स्त्रियांच्या दृष्टीने अत्यंत हीन दर्जाची प्रथा होती. पती निधनानंतर स्त्रिया सती जात होत्या. पण पत्नी निधनानंतर मात्र एकही पुरुष 'सती' गेल्याचे उदाहरण आढळत नाही असा उल्लेख आवर्जून महात्मा फुले करतात. याशिवाय पुरुष अनेक स्त्रियांबरोबर लग्न करतो त्या सर्वजणी एकाच कुटुंबात 'सवती' म्हणून एकत्र नांदतात. पण त्या पुरुषाच्या पत्नीने दुसऱ्या पुरुषाशी लग्न करून त्यास आपल्या घरी आणले तर 'सवता' म्हणून ते पुरुष एकत्र राहू शकत नाहीत. या दोन्ही ठिकाणी पुरुषांचीच मक्तेदारी असून त्याखाली अनेक वर्षांपासून स्त्रिया दबलेल्या होत्या.[१६] अशा स्त्रियांमध्ये बंड करण्याची धारणा सावित्रीबाईंनी निर्माण केलेली होती.

सत्यशोधक चळवळीचे नेतृत्व : महाराष्ट्रातील समाजसुधारणेच्या चळवळीत संस्थात्मकदृष्ट्या पहिली क्रांती करण्याचे कार्य महात्मा फुलेंच्या सत्यशोधक समाजाने केलेले आहे. दिनांक २४ सप्टेंबर १८७३ रोजी पुणे येथे सत्यशोधक समाजाची स्थापना झाली. १७ संस्थेचे पहिले अध्यक्ष व खजिनदार महात्मा फुले होते. तर कार्यवाहक नारायण गोविंदराव कडलक होते. 'सर्वसाक्ष जगत्पती त्याला नको मध्यस्थी' हे ब्रीद वाक्य आहे. महात्मा फुले यांच्या निधनानंतर सत्यशोधक चळवळीचे नेतृत्व सावित्रीबाईंनी केले. त्यांना हे कार्य करण्याचे बाळकडू महात्मा फुलेंच्या काळातच मिळाले होते. सन १८७६ साली दुष्काळ पडला त्यावेळी सावित्रीबाईंनी महात्मा फुले यांना लिहिलेले पत्र फार अर्थपूर्ण होते.[१८]

२० एप्रिल १८७७ ओतूर, जुन्नर

सत्यरूप जोतीबा स्वामी यांस,

सावित्रीचा शिरसाष्टांग दंडवत.

पत्रास कारण की गेले १८७६ साली लोटल्यानंतर दुष्काळाची तीव्रता वाढून सर्वजण व जनावरे चिंताक्रांत होऊन गतप्राण होऊन धरणीवर पडू लागली आहेत. माणसांना अन्न नाही. जनावरांना चारापाणी नाही. यास्तव कित्येक देशांतर करून आपले गाव टाकून जात आहेत. असे इकडचे भयानक वर्तमान आहे.

सत्यशोधक मंडळींनी या भागात लोकांस अन्न धान्य पुरविण्यास्तव धीर देण्यास्तव दुष्काळनिवारण कमिट्या स्थापल्या. भाऊ कोंडाजी व त्यांच्या उमाबाई मला जीवापलीकडे सांभाळतात. ओतूरचे शास्त्री गणपती सखाराम डुंबरे पाटील वगैरे आपल्या समाजाचे सत्यशोधक तुम्हास भेटण्यासाठी येणार आहेत. रा.ब.कृष्णाजी पंत लक्ष्मणशास्त्री हे आपणास विश्वासू आहेत. त्यांनी माझ्या समवेत दुष्काळी गावात जाऊन दुष्काळाने हैराण झालेल्या लोकांना द्रव्यरूपाने मदत केली. दुसरी चिंतेची बाब अशी की सावकारांना लुटावे, त्यांची नाके कापावीत अशी दुष्ट कर्मे या भागात घडत आहेत. हे श्रवण करून कलेक्टर येथे आला. ५० सत्यशोधक पकडून नेले. त्याने मला बोलविले. तेव्हा मी उत्तर केले की आमच्या लोकांवर आळ व कुभांड घेऊन कैदेत ठेवले ते सोडा. कलेक्टर न्यायी आहे. तो गोऱ्या फौजदारास रागे भरून बोलला की, पाटील का दरोडे घालतात? त्यांना सोडून दे. कळवळून त्याने आपल्या केंद्रात ज्वारीच्या चार गाड्या पाठविल्या आहेत.

– सावित्री जोतिबा फुले

वरील पत्रावरून दुष्काळाची दाहकता दिसून येते. तेथे सावित्रीबाईंनी केलेले कार्य महत्त्वाचे आहे. यामुळेच पुढील काळात त्या सत्यशोधक समाजाद्वारे कार्यरत राहिल्या होत्या. सन १८९३ मध्ये सासवड येथे भरलेल्या सत्यशोधक समाजाच्या २० व्या परिषदेच्या त्या अध्यक्षा होत्या.[१९] त्यांनी पुरंदर, जुन्नर भागात

फिरून लोकांना भट पुरोहितांकडून होणाऱ्या त्रासाची, धार्मिक छळाची माहिती देत होत्या. इंदापूर तालुक्यात सत्यशोधक समाजाची शाखा सुरू केली.

सावित्रीबाईंचे साहित्य : सावित्रीबाई ह्या उत्तम साहित्यिक होत्या. त्यांचा वयाच्या २३ व्या वर्षी 'काव्यफुले' (१८५४) तर सन १८९२ मध्ये 'बावन्नकशी सुबोध रत्नाकर' हे दोन काव्यसंग्रह प्रसिद्ध झाले.[२०] याशिवाय ज्योतिबांची भाषणे (१८५६), सावित्रीबाईंचे ज्योतिबास पत्र, मातुश्री सावित्रीबाईंची भाषणे (१८९२) इत्यादी साहित्य देखील प्रसिद्ध आहे.

सावित्रीबाई फुले यांचे निधन : महात्मा फुलेंच्या निधनानंतर सावित्रीबाईंना आर्थिक संकटांना तोंड द्यावे लागले. अशा संकटमय प्रसंगी १० फेब्रुवारी १८९२ रोजी बडोद्याचे सयाजीराव गायकवाड यांनी १ हजार रुपयांचा धनादेश तुकाराम तात्या पडवळ ह्यांच्या एस. नारायण कंपनीत गुंतविला. त्याच्या तिमाही ५० रुपये व्याजातून सावित्रीबाईंना मदत झाली. सन १८९६-९७ मध्ये प्लेगने अनेकांचा बळी घेतला. प्लेग पसरू नये म्हणून त्या गोऱ्या अधिकाऱ्यांना सूचना देत होत्या. ठिकठिकाणी हॉस्पिटल उभारण्यासाठी प्रयत्न करीत होत्या. ज्ञानोबा ससाणे यांच्या वानवडी-घोरपडी परिसरात हॉस्पिटल उघडून मुलगा डॉक्टर यशवंतच्या मदतीने लोकांची सेवा करीत होत्या. मुंढवा येथील हरिजन वस्तीतल्या पांडुरंग बाबाजी गायकवाड या मुलाला प्लेगची लागण झालेली होती. त्याला हॉस्पिटलमध्ये घेऊन जात असतानाच सावित्रीबाईंना देखील प्लेगची लागण झाली. त्याचवेळी दिनांक १० मार्च १८९७ रोजी रात्री ९.०० वाजता सावित्रीबाईंचे निधन झाले.[२१]

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संदर्भ ग्रंथ :

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क्रांतिज्योती सावित्रीबाई ज्योतिराव फुले

- डॉ. प्रगती मरकवार

शिक्षणाच्या क्षेत्रातून सामाजिक क्षेत्रात पदार्पण करावे, दुष्काळात अन्नान्न करून तडफडणाऱ्या हजारो जिवांच्या मुखांत घास भरवावा, शेतकरी-सामाजिक सुधारणांसाठी वाङ्मयाचे साधन हाती घेऊन कवयित्री आणि लेखिका बनावे, सर्व गाव, सर्व समाज शिक्षित, सुसंस्कृत करण्याचे जनावरांप्रमाणे जिणे जगणाऱ्या स्त्री-शूद्रांना माणसात आणण्याचे वेड घ्यावे, पतीच्या निधनानंतरही शोक करीत न बसता सत्यशोधक समाजाच्या तत्त्वप्रसाराचे कार्य करण्याचे सतीचे वाण घेऊन अविश्रांत कामे करावे, दीनदलितांसाठी, दीनदलितांच्या मुलांसाठी रोगांच्या साथीत दिवसा-रात्री घराबाहेर धावावे, त्यांची सेवा करावी, प्लेगच्या साथीत त्यांना कडेवर घेऊन आपला दत्तक मुलगा डॉ.यशवंतराव फुले यांच्या दवाखान्यात घेऊन जावे, तेथे प्लेगच्या रोगाला आपण बळी पडत असल्याची जाणीव होऊनही रुग्णांची सेवा करीत राहावी आणि ही सेवा करता करता अनंतात विलीन होऊन जावे. अशा या व्यक्तिमत्त्वास केवळ अलौकिक हे एकच विशेषण योजिता येईल.

सावित्रीबाईंचे व्यक्तित्व :

सावित्रीबाईंचा जन्म एका गरीब शेतकरी कुटुंबात झालेला. शिक्षणांचे संस्कार नाहीत, अशी ही निरक्षर कुटुंबात जन्मलेली, वाढलेली स्त्री ज्योतिरावांच्या हाताखाली शिक्षणाचे धडे गिरविते, शिक्षक-प्रशिक्षण घेते, आणि ज्ञानदानाचे व्रत घेऊन ज्ञानयोगिनी बनते.

फुले दांपत्याने शाळा काढल्या. १८४८ ते १८५२ या चार वर्षांच्या कालावधीत पुणे आणि पुण्याच्या ग्रामीण परिसरात एकूण अठरा शाळा काढल्या आणि त्या यशस्वीपणे चालविल्या. या शाळा चालविण्यासाठी त्यांना अविश्रांत परिश्रम केले. त्यांनी दिवस पाहिला नाही की रात्र पाहिली नाही, तहानभूक विसरून या दांपत्याने या परोपकारी कृत्याचा पिच्छा न सोडता हा ज्ञानदानाच्या यज्ञ अहोरात्र प्रज्वलित ठेवला. फुले दांपत्याचे हे कार्य म्हणजे या दांपत्याने घडवून आणलेला एक चमत्कार होता. कारण त्या काळात अशा शाळा चालविणे या अशक्य कोटीतील गोष्टी होत्या.

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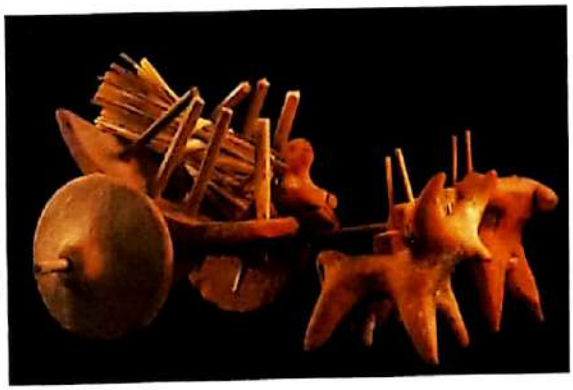



डॉ. भूषण फडतरे

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सेमिस्टर-१

नवीन अभ्यासक्रम
सी.बी.सी.एस. पॅटर्न

प्राकृतिक भूगोल

पेपर क्र. १

डॉ. ज्योतिराम चंद्रकांत मोरे
डॉ. संजय दगू पगार
अशोक मारुती थोरात

NIRALI PRAKASHAN
ADVANCEMENT OF KNOWLEDGE

FIRST YEAR B. A.
SEMESTER-I

NEW SYLLABUS
CBCS PATTERN

PHYSICAL GEOGRAPHY-I

Dr. JYOTIRAM C. MORE
Dr. MANOJKUMAR P. DEVNE

NIRALI PRAKASHAN
ABUNDANCE OF KNOWLEDGE

एफ. वाय. बी. ए.
सेमिस्टर-२

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सी.बी.सी.एस. पॅटर्न

मानवी भूगोल

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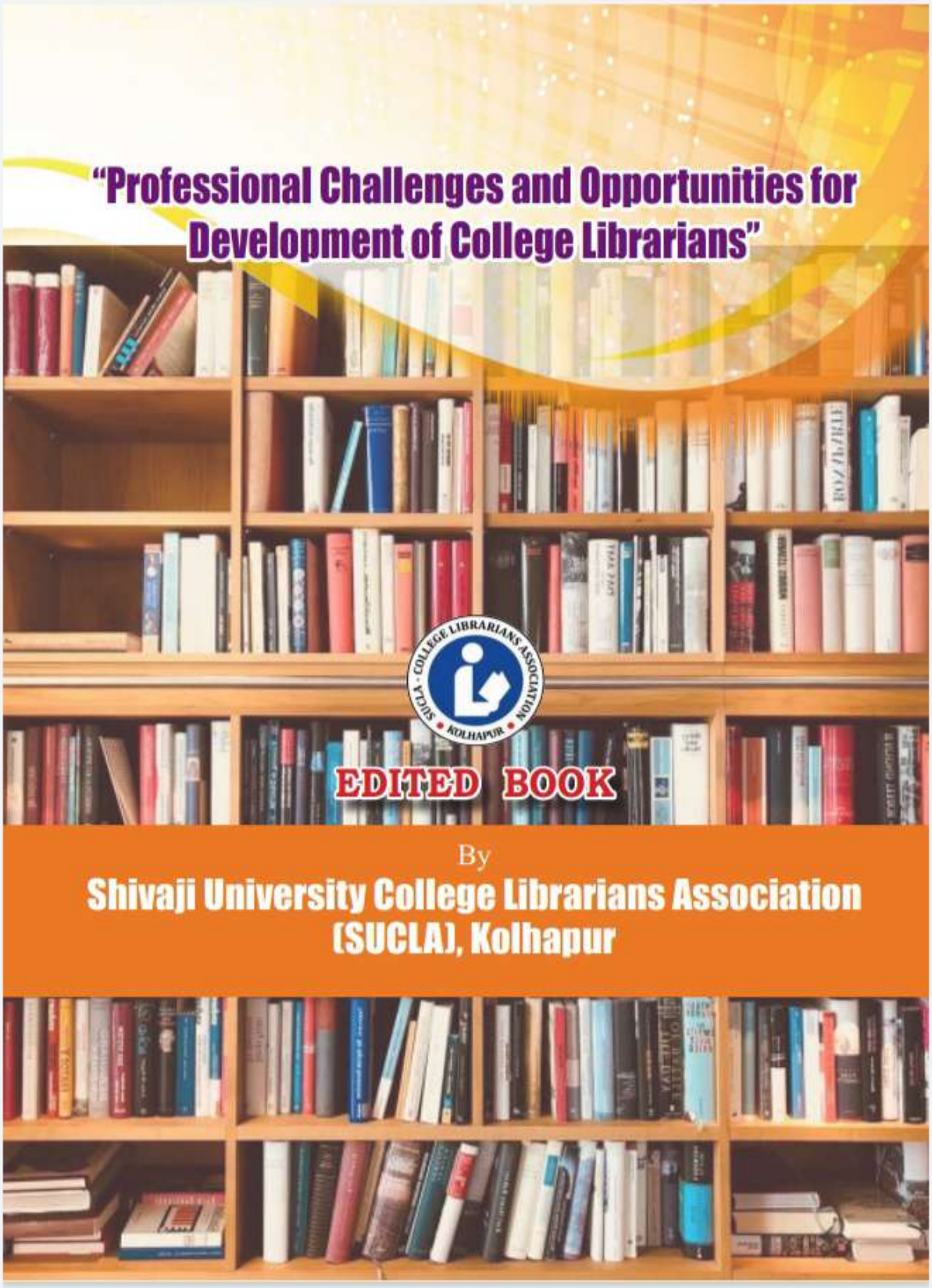

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By

Shivaji University College Librarians Association (SUCLA), Kolhapur

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"Professional Challenges and Opportunities for Development of College Librarians"

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"Information Literacy"

Sameer Popat More

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Abstract *: This paper represents information literacy need, importance and models. Information Literacy is used in many forms means media, printed, cultural, virtual, computer, and Network literacy, which is very important for students to become individuals today. Come into the world National and international organizations are implementing information literacy program.*

Keywords *: Literacy, Information Literacy*

INTRODUCTION :

The concept of information literacy was first introduced by the President of the information industry association at the National Commission on Libraries and Information Science in 1979. Information literacy is another feature of recent innovations in education and is paramount in any education system. It is a new concept that has emerged as a result of the challenges the world is facing in the information forum. It has come about as a result of globalization which was prompted by world wide networks, information explosion which was caused by the development of ICTs, Information overload which was triggered by too much information being posted on the Internet and the web as well as technological developments such as Facebook, blogs, wikis, websites etc. Information nowadays is everywhere and this has resulted in information literacy being taught to scholars and society at large.

Definition :

Paul Zurkowski says "People are trained in the application of information sources to their work can be called information literates they have learned to work their information can be called literates they have learned techniques and skills using a wide range of information tools as well as primary sources in molding information solutions to them problems". After a thorough knowledge of information literacy, it is noticed that many kinds of information come to fruition in the first place. One should want to know. Good skills should be used to formulate questions. Research methods should be identified and good skills should be used to evaluate experimental and empirical findings

Chartered Institute of Library Information Professionals(CILIP) According to in the new concept of information literacy 2018 " Information Literacy is the ability to think critically and make balanced judgments about any information we find and use it empowers us as citizens to reach and express informed views and to engage fully with society".

The aim of which was to develop a new approach to information literacy teaching and learning that was suitable for the skills required of 21st century higher education student

According to A New Curriculum for Information Literacy(ANCIL) 2011 "Information Literacy is a continuum of skills, behaviours, approaches and values that is so deeply entwined with the uses of information as to be a fundamental element of learning scholarship and research it is the defining Characteristic of the discovering scholar the informed and judicious citizen and the autonomous learner".

Information literacy practitioners are pervasive in the state of thinking and are examples of the ethical use of information. In the future, there will be different forms of presenting information that are not even thought to be Visual media, Computer Media, Network Media and of course basic literacy, etc. You need to learn the skills of literacy.

Visual Literacy : Virtual literacy is defined as the ability "to understand and use images, including the ability to think learn and express oneself in terms of images. When we look at virtual information such as photographs, computer graphics, etc., we can learn about our world Relies on prior knowledge. Virtual Learning Virtual Thinking Virtual Communication Virtual Teaching means the acquisition and construction of knowledge that is the result of communication in the event.

Media Literacy : Representatives of the Media Literacy Movement came together at the National Leadership Conference on Media Literacy in 1992 and decided to define media literacy Media Literacy is the media literacy movement that discovers a person's unique impartiality in finding and analyzing and analyzing and generating information. Experts learn to read traditionally It may have cost more and spent only a short time focusing on media literacy.

Computer Literacy :

Computer literacy is the ability for general public to create personal computer identities and documents, to govern them and to generate and manipulate data through word processors, spread sheets, databases and software tools.

Digital Literacy :

Considering the vast array of Digital literacy tools that are available online and thus highlighting the importance of looking closely at the digital. While the word Literacy alone generally refers to reading. The word 'Digital' before it the term encompasses much, much more. Reading and writing are still very much at the heart of digital literacy. The term is so broad that some experts even stay from it performing to speak more specially about particular skills at the intersection of technology and literacy.

Network Literacy :

Network Literacy is a form of digital literacy however it is specially based around the skills required to navigate networks. Network Literacy involves basic knowledge about how networks can be used as a tool for discovery and decision making and about both their potential benefits and pitfalls made accessible for all people living in today's networked world. Network literacy is very closely related to computer literacy Search using search information this network literate should be available to all network environments such as the World Wide Web.

Information Literacy Models and Frameworks: There are a range of information literacy models but below are just few-

CILIP information Literacy Model :

CILIP have developed an information literacy model that contains eight competencies / understandings that a person requires to be information literate:

- a need for information
- the resources available
- how to find information
- need to evaluate results
- how to work with or exploit results
- ethics and responsibility of use
- how to communicate or share your finding
- How to manage your findings.

The Society of College, National and University Libraries (SCONUL) : developed the Seven Pillars of Information Literacy model in 1999, and the most recent version was published in 2011. The latest version recognizes that becoming information literate "is not a linear process", rather, individuals can take different paths to become information literate and may learn different skills at different points.

The following 'lenses' have been created which take the seven pillars and observe them through the eyes of individuals engaged in the following types of activities:

- Research lens
- Digital Literacy lens
- Open Educational Resources lens
- Evidence-based practice healthcare lens

A New Curriculum for Information Literacy (ANCIL) was developed as the result of a research project by Emma Coonan and Jane Secker. The aim of which was to develop a new approach to information literacy teaching and learning that was suitable for the skills required of a 21st century higher education student. The curriculum contains ten strands which take a holistic view of information literacy learning and place it within a wider context.

Conclusion :

In this research paper, information literacy was reviewed as well as why the information literacy community is required. Information literacy definitions. The concept of information literacy is spreading widely and it needs to be disseminated and disseminated. Information literacy skills described the research process as well as explained how information literacy skills facilitate research endeavors of individuals like students in the society.

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भारतीय स्वातंत्र्य चळवळीचा आर्थिक परिप्रेक्ष्यातून अभ्यास

(१७५७-१९४७)



• संपादन •

डॉ. उत्तम पठारे । डॉ. लहू गायकवाड

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ग्रामोन्नती मंडळाचे

कला, वाणिज्य व विज्ञान महाविद्यालय

नारायणगाव, ता. जुन्नर, जि. पुणे, ४१० ५०४.

(पदव्युत्तर इतिहास संशोधन केंद्र)

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(पदव्युत्तर इतिहास संशोधन केंद्र)

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अनुक्रमणिका

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आधुनिक उद्योगधंद्याचा उदय व विकास

- डॉ. भूषण फडतरे

भारतीयांच्या दृष्टीने १९ वे शतक हे 'प्रबोधनाचे शतक' म्हणून ओळखले जाते. याच शतकात येथे आधुनिक उद्योगधंद्यांचा झालेला उदय व विकास हा परिवर्तनाच्या दृष्टीने महत्त्वाचा ठरलेला आहे. अशा या यंत्रयुगाची सुरुवात लॉर्ड डलहौसीच्या काळात रेल्वे उद्योगात झालेली असून ती पुढे तारायंत्र, डाकसेवा, कापडगिरणी, लोह, पोलाद, रासायनिक, साखर अशा अनेक उद्योगधंद्यांमध्ये झाली. उद्योगधंद्यांचे केंद्रबिंदू मुंबई असल्याने भारताची औद्योगिक राजधानी म्हणून ते प्रसिद्धीस आले आहे. उद्योगधंद्यांच्या काळात भारतात मध्यवर्गाचा उद्‌य झाला आणि या मध्यवर्गाचे भारतातील सर्व प्रकारच्या चळवळीचे धुरीनत्त्व केले. एकंदरीत आर्थिक दृष्टिकोन ब्रिटिशांचे शासना भारताची लूट करणारे होते. परतुं भारताला राष्ट्र बनविण्यात सामाजिक वातावरणात मुक्तता आणण्यात आणि नवीन तंत्रज्ञानाची ओळख करून देणे यात ब्रिटिशांचे योगदान नाकारता येणार नाही. ब्रिटिशांच्या काळात या सोयीसुविधांमध्ये विज्ञान, तंत्रज्ञानाचा झालेला वापर आणि त्याला भारतीयांनी दिलेला प्रतिसाद देखील महत्त्वाचा आहे.

रेल्वे

भारतातील रेल्वे निर्मितीला लॉर्ड डलहौसींबरोबर जगन्नाथ शंकर शेठ यांचेही योगदान आहे. जगन्नाथ शंकर शेठ यांच्या पुढाकारातून सन १८४३ मध्ये 'ग्रेट ईस्टर्न रेल्वे' अशी कंपनी स्थापन झाली. संस्थापक जगन्नाथ शंकर शेठ, जमशेटजी जीजीभाई, सुप्रिम कोर्टाचे मुख्य न्यायाधीश सर पेरी आणि इतरांनी १३ जुलै १८४४ रोजी सरकारकडे विनंती अर्जाद्वारे मुंबईत रेल्वे उभारण्यासाठीची परवानगी मागितली होती. सन १८४५ मध्ये कंपनी सरकारने गव्हर्नर कौन्सिलचा सदस्य विलागे बी यांच्या अध्यक्षतेखाली मुंबई इलाख्यातील रेल्वे मार्गाची पाहणी करण्यासाठी समिती नेमली. त्यांच्या मदतीला येथील एक अभियंता व इंग्लंडवरून दोन लोक बोलविले होते. त्यांचा

रिपोर्ट तयार झाल्यानंतर भारतात रेल्वे उभारणीसाठी लंडनमध्ये वॉर्नक्लिफ यांच्या नेतृत्त्वाखाली कंपनी स्थापन केली. यावेळी रेल्वेसाठी कंपनीचे भाग भांडवल ३५ लाख तर १५ लाख रुपये मुंबईतील लोक यांचे राहील. अवघ्या दीड महिन्यात जगन्नाथ शंकर शेठ यांनी मुंबईतील लोक यांकडून १५ लाख रुपये भागभांडवल जमा केले. पहिली रेल्वे दि. १६ एप्रिल १८५३ रोजी बोरी बंदर ते ठाणे मार्गावर धावली. तीन इंजिने व चौदा डबे असणारी ही रेल्वे ५५ मिनिटात ३४ कि. मी. चे अंतर पार करत ठाणे येथे आली.[१] या रेल्वेचा सुरुवातीचा उद्देश हा भारताच्या ग्रामीण भागातून कच्चा माल व्यापारी बंदरापर्यंत आणणे आणि भारतीय बंदरातून पक्का माल ग्रामीण भारतापर्यंत पोहोचवणे आणि दुसरा उद्देश म्हणजे जर काही अचानक शासनाच्या विराधोत झाले तर सैन्य आणि संसाधनाची जमवाजमव करणे. रेल्वे मार्गाला अधिक गती देणे यासाठी व जमीन संपादनासाठी सन १८५७ मध्ये प्रस्कॉट यांच्या अध्यक्षतेखाली 'रेल्वे मंडळ' स्थापन केले[२] पुढच्याच वर्षी पुणे-खंडाळा रेल्वे सुरू झाली. पुढे हाच मार्ग इगतपूरीपर्यंत गेला. पुढे दोन दशकांमध्ये विशेषत: खानदेशामध्ये रेल्वेमार्ग वाढविण्यावर भर दिला. कारण या परिसरातील कापूस हा रेल्वे मार्गाने मुंबईतील कारखान्यांना पोहोचविला जाणार होता आणि ते पुढे सत्यही झाले.

सन १८५३ पासून १९०५ पर्यंत ब्रिटिशांनी भारतात २८,००० मैलांच्या रेल्वे पटऱ्या बनविल्या. १९४७ पर्यंत हा आकडा सरासरी ४०,००० मैलापर्यंत पोहोचला. भारतात रेल्वेचे काम खासगी कंपन्यामार्फत शासनाने हमी देऊ करून घेतले. रेल्वेचे इंजिन व डबे दुरुस्ती व त्यांना रंगरंगोटी करण्यासाठी १९५०च्या सुमारास महाराष्ट्रात ३१ कारखाने होते. येथील रेल्वेचा फायदा ब्रिटिश उद्योगांना झाला. रेल्वेमुळेच भारतातील कोळसा व पोलाद उद्योगाला मोठी चालना मिळाली. सुरूवातीला रेल्वेचा फायदा ब्रिटिशांना झाला, परंतु नंतरच्या काळात या सेवेचा खरा फायदा भारतीयांना झाला. एकतर रेल्वेने भारताला राष्ट्र बनवण्यात खूप महत्त्वाचे योगदान दिले. अगोदरही भारतात सांस्कृतिक ऐक्य होते. परंतु रेल्वेने विचारांच्या प्रसाराची गती वाढली. यांचे जाणे-येणे वाढले त्यामुळे संवाद वाढला.

१९ व्या शतकाच्या मध्याच्या सुमारास भारतात आधुनिक व संघटित उद्योगांची सुरुवात झालेली दिसते. युरोपातील क्रिमियन युद्धामुळे (१८५४) रशियातून युरोपमध्ये जाणारा ताग बंद झाला. त्यामुळे ब्रिटिशांना भारतातील तागावर अवलंबून राहावे लागले. कच्च्या तागाची मागणी इंग्लंडमध्ये वाढली. येथून कच्चा माल घेऊन जाण्यापेक्षा तेथेच ताग गिरणी सुरू करण्याबाबतचा पहिला विचार जॉर्ज ऑकलंड यांनी मांडला. ब्रिटिशांनी बंगालमधील विश्वंभर सेनकडून भांडवल घेऊन सन १८५५ मध्ये रिश्रा येथे पहिली ताग गिरणी काढली. अफाट नफा मिळाल्याने इंग्लंडमधील भांडवलदारांनी येथे ताग गिरण्या काढण्यास सुरुवात केली.[३] १९०१ पर्यंत ताग गिरण्यांची संख्या ३६ वर, तर मजुरांची संख्या १,१५,००० वर गेली. कोळशाच्या खाणीत १९०६ पर्यंत १,००,००० कामगार काम करत होती. १९१३ ते १४ पर्यंत कापड गिरण्यांची संख्या ६४ वर गेली तर ताग गिरण्याही ६४ झाल्या होत्या. १९१४ साली कोळशाच्या खाणीत १,५१,३७६ कामगार काम करीत होते. १८५० ते १९१४ या काळात भारत हा ताग उद्योगात जगात सर्वांत अग्रेसर होते. कापड उत्पादनात चौथ्या क्रमांकावर गेले तर भारतीय रेल्वे जाळे जगात तिसऱ्या क्रमांकाचे राज्य ठरले. मुंबईतील दमट हवामान सुताचा धागा तुटत नसल्यामुळे कापड व्यवसायासाठी उपयुक्त होते, तसेच नैसर्गिक बंदर असण्याचाही आयात-निर्यातीबाबत फायदा होताच. या कारणांमुळे १८५४ मध्ये मुंबई येथे कावसजी नानाभाई दावर यांनी बॉम्बे स्पिनिंग आणि विव्हिंग कंपनी लि. नावाची पहिली कापड गिरणी सुरू करण्यात आली.[४] तर १८५५ मध्ये भडाचे येथे कापड गिरणी सुरू झाली. कापड गिरण्यांची १८६५-७१ या दरम्यान फारच कमी प्रगती झाली. १८६५ मध्ये १३ गिरण्या होत्या, त्यापैकी मुंबईला १० व कलकत्त्याला २ व इतरत्र १ होते. सन १८६९ मध्ये मात्र सुएझ कालव्याचे उद्घाटन झाले. त्यामुळे मुंबई आणि लंडनचे अंतर ६,४०० कि. मी. ने कमी झाले. तसेच या काळात आपल्या देशातील रेल्वेमार्गांचे जाळे १८,२०० कि. मी. पर्यंत वाढले.

तसेच १८७८ मध्ये मात्र इंग्लंडमध्ये भारतीय कापडावरील आयात कर बऱ्याच प्रयत्नांनंतर उठवण्यात आला. परिणामी मुंबईत कापड व्यवसायाचा विकास झाला. यावर्षी कापड गिरण्यांची संख्या ५८ वर गेली होती. येथील

कापड उद्योग भरभराटीस कामगारांची संख्याही झपाट्याने वाढली असल्याचे दिसून आले आहे.[५]

मुंबईतील पारशी, भाटिया यांनी कापड गिरण्यांसाठी मोठ्या प्रमाणात भांडवल गुंतवले. चीनबरोबरचा कापूस आणि अफूचा व्यापार त्याचप्रमाणे अमेरिकेच्या यादवी युद्धात केलेल्या कापसाच्या निर्यातीमुळे उपलब्ध झालेला पैसा हा भांडवल म्हणून वापरला. मुंबईत प्रामुख्याने परळ, लालबाग, भायखळा या भागात कापड गिरण्यांचे केंद्रीकरण झालेले होते. मुंबईत कापडगिरण्यांची संख्या वाढत असतानाच कापसाचे वायदे नियंत्रित ठेवण्यासाठी १८७५ मध्ये मुंबई येथे '*बॉंबे कॉटन ट्रेड असोसिएशन लि*' या संस्थेची स्थापना झाली. सन १९१४ मध्ये जगातील कापड उत्पादनात भारताचा चौथा क्रमांक होता. यावरून येथे कापड निर्मितीची प्रक्रिया किती झपाट्याने होती हे लक्षात येते. १९१५ मध्ये 'द बॉंबे कॉटन ब्राकेर्स असोसिएशन' ची स्थापना झाली.[६]

१९२१ नंतर मात्र कापड उद्योगधंद्याचे विकेंद्रीकरण सुरू झाले. या विकेंद्रीकरणाला १९२३ नंतरच्या कापड उद्योगातील मंदीमुळे चालना मिळाली. मुंबईचे कापड उद्योगधंद्याचे स्थान कमी होत जाऊन देशाच्या अतंर्गत भागात कापडगिरण्यांचा उदय झाला. १९१९ मध्ये मुंबईत कापड व्यवसायाचे प्रमाण ६८.८ टक्के होते. तिचे प्रमाण १९४५ मध्ये ४९.६ टक्के पर्यंत घटले. याचबरोबर देशाच्या अतंर्गत भागातील दळणवळण व वाहतुकीच्या सोयीत वाढ झाल्यामुळे नागपूर, सोलापूर व देशाच्या इतर भागांत कापड गिरण्या उभारल्या. वरील शहरे कापूस उत्पादनाच्या आणि बाजारपेठेच्या जवळ असल्यामुळे कापूस आणि कापडाच्या वाहतुकीचा खर्च वाचला. अंतर्गत बाजारपेठ उपलब्ध झाली. त्याचप्रमाणे संस्थानिकांनी देखील कापड गिरण्या उभारण्यासाठी नाममात्र किंमतीत जमिनी उपलब्ध करून दिल्या, तसेच करामध्येही सवलत दिल्या. याचकाळात जलविद्युत शक्तीची नवी सोय उपलब्ध झाल्यामुळेही कापडउद्योगधंद्याचे विकेंद्रीकरण झाले. उदा. तामिळनाडूमध्ये सूत कातणे आणि कापड विणणे हे व्यवसाय विकसित झाले. याच काळामध्ये मुंबईमध्ये मजुरीचे दर मोठ्या प्रमाणात वाढले होते.

कापडाच्या उद्योगधंद्यात एकूण किमतीपैकी २० ते २७ टक्के मजुरी असते. त्या मानाने राज्याच्या इतर भागांमध्ये मजुरीचे दर कमी होते म्हणून १९३३ नंतर सोलापूर, बार्शी, धुळे, अंमळनेर, जळगाव येथे व देशाच्या

अन्य भागात नवीन कापड गिरण्या सुरू झाल्या. या नवीन कापड गिरण्यांनी मुंबई आणि अहमदाबादमधील जाड्या-भरड्या कापडाची बाजारपेठ व्यापली. साहजिकच मुंबई आणि अहमदाबादच्या गिरण्यांचे तलम आणि उत्तम प्रकारच्या कापडाकडे लक्ष द्यायला सुरुवात केली. मुंबई, सोलापूर, नागपूर, इंदूर, अहमदाबाद एका रेषेने जोडल्यास महत्त्वाचा कापूस उत्पादनाचा साधारण प्रदेश निर्माण होतो. या प्रदेशात भारताच्या कापसाचे सुमारे ५५ % उत्पादन होते. कापड उद्योगामध्ये त्यांची उत्पादनक्षमता सूत उत्पादन आणि पुरवठ्यावर अवलंबून असते. त्यासाठी सहकार तत्त्वावर सूत गिरण्या स्थापन करण्यात आल्या. भारतातील पहिली सूतगिरणी आंध्रप्रदेशातील गटकुलमध्ये स्थापन करण्यात आली. तर महाराष्ट्रात पहिली सूत गिरणी इचलकरंजी येथे १८५४ मध्ये स्थापन करण्यात आली. इचलकरंजीला महाराष्ट्राचे 'मँचेस्टर' म्हणतात. तिसऱ्या पंचवार्षिक योजनेपासून सूत गिरण्या उभारण्याला गती मिळालेली दिसते.

लोहपोलाद उद्योग

भारतात एकोणिसाव्या शतकाच्या प्रारंभीला लोहउद्योगाची सुरुवात झाली. इ. स. १८०८ मध्ये ईस्ट इंडिया कंपनीने मद्रास येथे या उद्योगाची सुरुवात केली. १८३० मध्ये तत्कालीन मद्रास राज्यात अकोट जिल्ह्यात लोहपोलाद निर्मितीचा प्रयत्न केला. सन १८३९ साली बिहारमध्ये बाराकर येथे पहिला पोलाद कारखाना सुरू झाला. त्यानंतर १८५५ मध्ये राणीगंज येथे तर १८७५ मध्ये असनसाले येथे पोलाद कारखाने सुरू झाले. पुढे १९०७ मध्ये बिहार राज्यात जमशेदपूर येथे आधुनिक लोहपोलाद उद्योगाला सुरुवात झाली. भारतात भंगार मालावर प्रक्रिया करून पोलाद तयार करण्याचा पहिला कारखाना १९२८ मध्ये कानपूर येथे काढण्यात आला. अशा पद्धतीने भारतात पोलाद निर्मितीला चालना मिळाल्यामुळे येथील औद्योगिक उद्योगधंद्यांना गती मिळालेली होती. भारतातील आधुनिक उद्योगधंद्यांचे प्रर्वतक मानले जाणारे जमशेदजी नसरवानजी टाटा यांच्या मते, 'इतर पुढारलेल्या राष्ट्रांच्या बरोबरीने भारताला जायचे असले तर त्याचे औद्योगिक कार्यक्षेत्र विस्तृत झाले पाहिजे; भारताची भौतिक उन्नती होण्याचा शक्य कोटीत असणारा मार्ग हाच आहे' [७]

पोलाद उद्योगाचा पाया असणाऱ्या जमशेदपूर येथे जमशेदजी टाटा यांनी १९११ साली 'टाटा आर्यन ॲन्ड स्टील कंपनी (टिस्को)' या नावाने

स्थापना केली. या कारखान्याचे सर्व भाग भांडवल हे भारतीयांचे होते हे या कंपनीचे वैशिष्ट्य होते. या कंपनीमुळे लोखंड उद्योगास मोठ्या प्रमाणात चालना मिळाली. जमशेदजी टाटा यांनी जलविद्युत निर्मितीलाही चालना दिली. सन १९१३ ते १९१८ या काळात भारतातील पोलाद उत्पादन ५,१००० टनांवरून १२,४००० हजार टन वाढले. त्याचे श्रेय जमशेदजी टाटा यांनाच दिले जाते. त्यामुळेच 'भारतातील व्यापार व उद्योग यांच्या भरभराटीसाठी कोणत्याही तत्कालीन भारतीयाने जमशेदजी इतके प्रयत्न केले नाहीत.'[८] असे लॉर्ड कर्झनने काढलेले उद्गार अर्थपूर्ण आहे. स्वातंत्र्यानंतर पंचवार्षिक योजनेतंर्गत भिलाई, रुरकेला, दुर्गापूर, बोकरो या ठिकाणी अत्याधुनिक प्रकल्पांची स्थापना करण्यात आली. यासाठी रशिया, जर्मनी, ब्रिटन या देशाचे साहाय्य घेणे यात आले. भारतात भंगार मालावर प्रक्रिया करून पोलाद तयार करण्याचा पहिला कारखाना कानपूर येथे काढण्यात आला भारतात लोहपोलाद निर्मितीची आठ प्रमुख केंद्रे आहेत. त्यातील पाच सरकारी क्षेत्रातील आहे व तीन खाजगी क्षेत्रातील आहेत. सरकारी क्षेत्रात भिलाई (मध्य प्रदेश), रुरकेला (ओरिसा), दुर्गापूर (पश्चिम बंगाल), बोकरो (बिहार) नैवल्ली (तमिळनाडू) आणि खाजगी क्षेत्रात जमशेदपूर (बिहार), कुल्टी-बर्नपूर (पश्चिम बंगाल), भद्रावती (कर्नाटक) येथे पोलाद कारखाने आहे.

रसायन उद्योग

उद्योगधंद्याचा विकास होण्यासाठी रासायनिक उद्योगधंद्याचा विकास होणे ही अत्यंत आवश्यक असते. ब्रिटिश येण्यापूर्वी भारतात दारूगोळा, शाई, नीळ, साबण, गंधक, जस्त इत्यादी तयार करण्याच्या पारंपरिक पद्धती होत्या. १९ व्या शतकामध्ये आधुनिक पद्धतीने रसायनांच्या निर्मितीला सुरुवात झाली. १८४९ मध्ये पहिल्यांदा मोठ्या प्रमाणात सल्फ्युरिक ॲसिडची निर्मिती करण्यात आली, तसचे चार्ल्स टनेन्ट याने पहिल्यांदा ब्लिचिंग पावडरचा शोध लावला व त्याच्या उत्पादन निर्मितीसाठी रसायन उद्योगाचा पाया घातला. परंतु भारतात मात्र दुसऱ्या महायुद्धानंतर रसायन उद्योगांचा विकास झाल्याचे दिसते. या महायुद्धाच्या काळात अल्कली इंडस्ट्रिजचा विकास झालेला दिसतो. तसेच १९४३ मध्ये टाटा केमिकल्सद्वारा मिठापूर येथे पहिला सोडाॲशचा कारखाना स्थापन करण्यात आला. १९५४ मध्ये HPC Oil Refinery ची स्थापना मुंबईमध्ये ३२१ एकरवर करण्यात आली होती.

झारखंडमधील सिंद्री येथे भारताचा पहिला खताचा कारखाना निर्माण करण्यात आला. १९५१ मध्ये त्याचे उद्घाटन पंडीत नेहरुंच्या हस्ते झाले. त्या प्रसंगीच पंडित नेहरूंनी असे कारखाने म्हणजे आधुनिक मंदिरे आहेत. असे उद्गार काढले होते. अमोनिअम सल्फेट, युरिआ, अमोनिअम नायट्रेट-सल्फेट इत्यादी खतांची निर्मिती तिथे सुरुवातीला केली जात होती. भारतीय हरितक्रांतीमध्ये या कारखान्याचा मोलाचा सहभाग आहे. थळ-वायशेत, तुर्भे येथेही खत कारखाने आहेत. रासायनिक उद्योगधंद्यामध्ये विविध प्रकारच्या रसायनांची निर्मिती करावी लागते. या दृष्टीने सल्फ्युरिक ॲसिड, हैड्रोक्लोरिक ॲसिड, नायट्रिक ॲसिड, सोडा, ॲचश, पेट्रोकेमिकल इत्यादींची गरज असते. प्रामुख्याने गंधकाची संयुगे आणि त्यांचे ॲसिड यांना मोठ्या प्रमाणात मागणी असते. महाराष्ट्रात अशा रासायनिक उद्योगधंद्याचे केंद्रीकरण मुंबई शहर व उपनगर, ठाणे व त्याचा परिसर, रायगड जिल्हा, पुणे व त्याचा परिसर, या क्षेत्रात झाला आहे. मुंबईला अभियांत्रिकी उद्योगांचे जाळे पसरलेले आहे. विविध प्रकारच्या उद्योगांना आवश्यक रसायने पुरवण्यासाठी, मुंबईला रासायनिक निर्मितीची अनेक केंद्रे आहेत. पेट्रोकेमिकल निर्मितीचे केंद्र तुर्भेला आहे. येथे असणाऱ्या तेल शुद्धीकरण कारखान्यामध्ये देशातील पन्नास टक्क्यांपेक्षा जास्त पेट्रोलियम पदार्थांच्या उत्पादनासाठी कच्चा माल पुरवला जातो.

मुंबईच्या खालोखाल ठाण्यामध्ये रासायनिक उद्योगांचा मोठ्या प्रमाणात विकास झाला आहे. अंबरनाथ, ठाणे, बेलापूर हा भाग रासायनिक विभाग म्हणून ओळखला जातो. या ठिकाणी प्रामुख्याने नॅप्था, इथिलीन व क्लोरीनचे उत्पादन घेतले जाते. हेवी केमिकल्सची उत्पादने मुंबई बरोबरच ठाण्याला ही घेतली जातात. याशिवाय औषधे कीटकनाशके, कॉस्टिक, सोडा, रंग, फौंड्री केमिकल, थर्माकोलचे उत्पादन मुंबई-ठाणे परिसरात केले जाते.

साखर उद्योग

भारतातील पहिला साखर कारखाने उभारण्याचे श्रेय फ्रेंचांना जाते. १८२४ मध्ये ओरिसातील अस्का येथे सुरू करण्यात आला होता. हा कारखाना १९४० मध्ये बंद पडला. पण तत्पूर्वीच सन १९२० मध्ये अहमदनगर जिल्ह्यातील बेलापूर येथे खासगी क्षेत्रातील महाराष्ट्रात पहिला साखर कारखाना उभारण्यात आला. त्यानंतर महाराष्ट्रात साखर कारखान्यांची वाढ होत गेली. महाराष्ट्राच्या शेती व्यवसायात कृषी व्यवसायावर आधारित साखर उद्योगधंदा हा

सर्वात प्रगत व्यवसाय मानला जातो. महाराष्ट्रात १९३३ ते १९४० या काळात वालचंदनगर, फलटण, श्रीरामपूर, कोपरगाव, बेलवंडी, रावळगाव, कोल्हापूर इत्यादी ठिकाणी खासगी कारखाने उभारण्यात आले. त्यांचे प्रमुख वैशिष्ट्य म्हणजे सर्व साखर कारखाने फक्त पश्चिम महाराष्ट्रातच उभारलले होते. असा बऱ्याच खासगी साखर कारखान्यांचे रूपांतर सहकारी साखर कारखान्यात झाले आहे. विठ्ठलराव विखे पाटील यांनी १९४८ मध्ये अहमदनगर जिल्ह्यातील लोणी येथे प्रवरा सहकारी साखर कारखाना हा देशातील पहिला सहकारी तत्त्वावर चालणारा कारखाना सुरू केला.[९] या कारखान्यावर संपूर्ण मालकी शेतकऱ्यांची असून सर्व नफाही शेतकऱ्यांना वाटला जात होता. अशा तत्त्वावर चालणारा आशिया खंडातील पहिला कारखाना आहे.

आधुनिक उद्योग धंद्यांचे परिणाम

०१. भारतातील आधुनिक उद्योगांच्या विकासामुळे भारत जागतिक बाजार पेठेशी जोडला गेला.

०२. भारतीय भांडवलदार हे परकीय भांडवलदारांचे कनिष्ठ सहकारी बनले नसून त्यांनी स्वत: भांडवल गुंतवणूक करून आपली वेगळी अस्मिता जोपासून १९२७ मध्ये 'द फेडरेशन ऑफ इंडियन चेंबर्स ऑफ कॉमर्स अँड इंडस्ट्रिजची' स्थापना केली.

०३. आधुनिक उद्योगधंद्यांच्या विकासामुळे नागरीकरणाला चालना मिळाली. त्यामध्ये लोकांची झालेली स्थलांतर ही औद्योगिक ठिकाणे म्हणून परिचित झाली.

०४. नवी औद्योगिक शहरे ही आर्थिक उन्नतीच्या दृष्ट्रीने तर महत्त्वाची ठरलीच. पण त्याच बरोबर राजकीय जागृतीची व सामाजिक चळवळींसाठी देखील महत्त्वाची ठरली आहेत.

०५. भारतीय भांडवलदार व राष्ट्रीय चळवळ हे दोन्हीही घटक एकमेकांना पूरक ठरल्या आहेत. स्वदेशीच्या राजकीय चळवळीने स्थानिक भांडवलदारांनी राष्ट्रीय चळवळीला हातभार लावला वेळ प्रसंगी राष्ट्रीय आंदोलनात सहभागी होताना तुरुंगवासही भोगला आहे.

०६. भारतीय भांडवलदार हे जरी समाजवादाच्या विराधोत असले तरी ते साम्राज्यशाहीचे विरोधक होते हे देखील महत्त्वाचे आहे.

०७. आधुनिक उद्योगधंद्यांच्या विकासामुळे प्रादेशिक विकासातील असमतोल

निर्माण झाला. शहरांचा उदय व विकास होत गेला, पण खेडी मात्र ओस पडू लागली होती.

०८. आधुनिक उद्योगांच्या विकासामुळे भारतीय समाजात भांडवलदार व कामगार हे दोन वर्ग उदयास आले. विशेषत: कामगार वर्गाची संघटना निर्माण होऊन चळवळी देखील झाल्या आहेत.

०९. आधुनिक उद्योगांच्या विकासामुळेच मुंबई, अहमदाबाद ही शहरे मँचेस्टर म्हणून उदयास आली.

१०. आधुनिक कारखान्यातून निर्माण होणाऱ्या वस्तूंची येथील लोकांना नव्याने ओळख झाली. त्यामुळे त्यांच्या आवडी, निवडीही पाश्चिमात्य लोकांप्रमाणचे होऊ लागल्या हे सांस्कृतिक दृष्ट्या परिवर्तन झाले.

११. आधुनिक उद्योगधंद्यामध्ये जमनालाल बजाज, किर्लोस्कर, टाटा हे जसे भांडलवदार म्हणून प्रसिद्धीस आले. तसे कामगार चळवळीचे नेतृत्त्व करणारे नारायण मेघाजी लोखंडे, ना. म. जोशी अशा नेतृत्त्वाची ओळख नव्याने पुढे आली.

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●●

आधुनिक भारताचा इतिहास आपण अनेकदा राजकीय अंगाने पाहतो. मात्र भारतीय राष्ट्रीय चळवळ विकसित होत गेली, ती आर्थिक संदर्भातूनसुद्धा, कारण इथल्या ब्रिटिश राजवटीचा थेट संबंध इंग्लंडच्या आर्थिक धोरणांशी व भारताच्या आर्थिक शोषणाशी होता. भारत इंग्लंडची आर्थिक वसाहत होती. वसाहतवादी अर्थव्यवस्थेची वाणिज्यवादी अवस्था (इ. स. १७५७-१८१३), खुल्या व्यापाराची अवस्था (इ. स. १८१३-१८५७) आणि वित्तीय साम्राज्यवादी अवस्था (इ. स. १८५८-१९४७) या टप्प्यांमधून जे स्थित्यंतर होत गेले, तसतसे भारताचे आर्थिक शोषण वाढत गेले आणि भारतातील असंतोषही वाढत गेला. एकोणिसावे शतक भारताच्या इतिहासातील एक वैशिष्ट्यपूर्ण टप्पा आहे. हे शतक म्हणजे भारतीय नवजागरणाचा, सामाजिक-धार्मिक सुधारणा चळवळींचा, आर्थिक विचारांचा, राष्ट्रवादाचा, स्वातंत्र्य आंदोलनाचा व आधुनिकतेचा आरंभकाल होता. या सर्वांना साकल्याने 'भारतीय प्रबोधन' म्हणता येईल. या प्रबोधनातूनच पुढे विसाव्या शतकात भारतात स्वातंत्र्य आंदोलन आकारास आले. भारतीय स्वातंत्र्य आंदोलनाचा पाया जसा येथील सामाजिक-धार्मिक सुधारणा चळवळींनी घातला, तसा तो एकोणिसाव्या शतकात अनेक सामाजिक विचारवंतांनी मांडलेल्या आर्थिक विचारांनी अधिकच मजबूत केला.

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प्राचीन विभाग - शोधनिबंध

मौजे चळे येथील अप्रकाशित वीरगळ

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कायम सभासद क्र. २३३

वीरगळ संकल्पना:

'वीरगळ' हे स्थानिक इतिहासाचे अस्सल साधन आहे ते मंदिराजवळ व वेशींजवळ दृष्टीस पडतात. शिवाय गावच्या कोपऱ्यावर, शिवारात देखील असतात. गावातील वीरपुरुष गाई, मंदिर व ग्रामरक्षण करताना धारातीर्थी पडला असेल तर त्यांच्या स्मरणार्थ, स्मृतीप्रित्यर्थ चित्रांकितरूपाने उभारलेल्या वैशिष्ट्येपूर्ण दगडाला 'वीरगळ' असे म्हणतात. अनेक वेळा 'वीरांचा दगड' म्हणूनही परिचित असतात. वीरगळांच्या निर्मितीमुळे पुढील पिढीला स्फूर्ती व प्रेरणा मिळते. अशा वीरगळाला इंग्रजीत हिरोस्टोन (Hero stone) किंवा स्टोन इमेज (Stone Image) असे संबोधले जाते. वीर-'कळ' ह्या कन्नड शब्दावरून वीरगळ हा शब्द महाराष्ट्रात आला आहे तर इतिहासाचार्य वि. का. राजवाडे यांच्या मते, 'कांदर' या शब्दाचा अपभ्रंश म्हणजे 'कांदळ' होय. 'कांदर' म्हणजे पर्वतातील कोरीव लेणे. लेणेचाच एक भाग म्हणजे वीरगळ होय. वीरगळांचा उगम कर्नाटकात झाला असला तरी त्याचा प्रसार महाराष्ट्रातही झाला. ह्यावरून महाराष्ट्राची अधिक भूमी ही लढाऊ वीरांची भूमी होती असे दिसून येते.

वीरगळ रचना व प्रकार :

स्थापत्यकलेचे अभ्यासक म. श्री. माटे यांच्या मते, 'वीरगळ निर्मितीचा काळ इ. स. १० ते १४ वे शतक असा आहे.' महाराष्ट्रात मुख्यत: दोन प्रकारचे वीरगळ आढळतात. पहिला प्रकार म्हणजे वीराच्या दगडावर तीन किंवा चार खणात काही प्रसंग कोरलेले असतात. तीन खणांचे वीरगळ अनेक ठिकाणी पाहण्यास मिळतात. तीन खण असलेल्या वीरगळावर सगळ्यात खालच्या खणात ज्याच्यासाठी हा दगड उभारावयाचा आहे, त्याचा मृत्यू कसा झाला हे दाखविले जाते. तेथे वीरांच्याबरोबर गाई कोरलेल्या असतात ते गोधन युद्ध, काही ठिकाणी नावा दिसतात ते नावीक युद्ध असते. म्हणजेच त्या वीराला वीरगती कशाने प्राप्त झाली त्याचे सूचक येथे कोरलेले असते. वीरगळ ओळखण्याच्या दृष्टीने हा खण अत्यंत महत्त्वाचा असतो. दुसऱ्या खणात वीरगती पावलेल्या वीराला अप्सरा खांद्यावर घेऊन कैलासाकडे घेऊन जातानाचे शिल्प कोरलेले असते. हा प्रवास पालखीतून, रथातून किंवा चालत खांद्यावर हात घेऊन जाणारा दाखविलेला

असतो. सर्वांत वरच्या खणात कैलासामध्ये शिवलिंगाची पूजा करताना वीर तेथे पुरोहित दाखविलेला असतो. शिवाचे वसतिस्थान कैलास असल्यामुळे कैलासपती म्हणूनही ओळखतात. शिवलिंगापुढे वीर दाखविल्याने तो कैलासवासी झाल्याचे सूचक दृश्य असते.[१] वीरगळाच्या सर्वांत वरच्या बाजूवर मंदिराचा कळस किंवा त्रिकोण असतो. त्याच्या बाजूस सूर्य व चंद्र यांच्या प्रतिमा कोरलेल्या असतात.

वीरगळाचा दुसरा प्रकार म्हणजे सतीचा वीरगळ होय. रणांगणावर धारातीर्थी पडलेल्या वीराच्या चितेवर आरूढ होऊन त्याच्या बरोबर सहगमन करून मोठ्या धैर्याने मृत्यू झालेल्या स्त्रीचे मरण हे देखील एक प्रकारचे वीरमरणच होय. अशा वीर स्त्रियांच्या स्मारक शिळांना 'सतीशिळा' किंवा 'सतीचा वीरगळ' असे म्हणतात. हा वीरगळ ओळखण्याची खूण म्हणजे त्रिकोणी माथा, सपाट दगडावर हाताच्या कोपरात काटकोनात दुमडलेला हाताचा पंजा दाखविलेला असतो, दंडावर नक्षीदार चोळी, मनगटापर्यंत चुडा भरलेला असतो. हे सतीच्या वीरगळाचे वैशिष्ट्ये आहे.[२] असा सतीचा वीरगळ वाघोलीपासून जवळच असणाऱ्या वाडे बोल्हाई येथील बोल्हाई मंदिराच्या कोपऱ्यावर आहे.

उल्लेखनीय वीरगळ :

महाराष्ट्रात अनेक ठिकाणी मिळालेले वीरगळ हे उल्लेखनीय असून प्रत्येकाचे वेगळे असे वैशिष्ट्ये दिसून येत आहे.

१. वाघोली येथील वीरगळ चारही बाजूंनी कोरलेला आहे.

२. खर्डा येथील वीरगळामध्ये वीर योद्धे घोड्यावरती आहेत.

३. ज्योतिबा येथील वीरगळामध्ये दोन वीर धारातीर्थी पडलेले असून दोघांनाही अप्सरा घेऊन जात आहेत.

४. गिरीम येथे गोधनासाठीचा वीरगळ आहे.

५. कोऱ्हाळे ब्रुदुक येथील दोन्ही वीरगळाचे वेगळेपण म्हणजे वीर हत्तीवरून लढत आहे. दुसरे म्हणजे स्त्री सुद्धा वीरांसारखीच लढत असून ती सुद्धा धारातीर्थी पडली आहे.

६ बकोरी येथील वीरगळ गद्देगळ प्रकारतील वीरगळ आहे.

७. नाव्ही सांडस व वाडे बोल्हाई येथील वीरगळ हे सतीचा वीरगळ आहे. त्या दोन्हीमध्ये देखील वेगळेपण आहे.

मौजे चळे येथे खोदकाम करताना सापडलेला वीरगळ :

शतकानुशतकांपासून ऊन, वारा, पाऊस सोसत मंदिर परिसरात, शेतात वीरगळ दृष्टीस पडतात. खोदकाम करतानाही वीरगळ मिळतात. अशा वीरगळावर मनुष्य, स्त्रिया, प्राणी, पक्षी, चंद्र, सूर्य कोरलेले असतात पण त्यांची माहिती गावातील लोकांना नसते. त्यामुळे अनेक वर्षांपासून वीरगळ हे संशोधनापासून दुर्लक्षित राहिल्याने त्यावर संशोधन

होणे महत्त्वाचे आहे त्याशिवाय त्यांचे संवर्धन होणेही महत्त्वाचे आहे.

मौजे चळे (ता. पंढरपूर, जि. सोलापूर) येथे नदी किनाऱ्यावर खोदकाम करताना वीरगळ सापडलेला असून तो माझ्या माहितीप्रमाणे अप्रकाशित आहे. मौजे चळे गावाजवळून वाहणाऱ्या भीमा नदीलगत सिद्धेश्वर विठ्ठल गायकवाड यांची शेती आहे. उन्हाळ्यामध्ये शेतीला पाणीटंचाई भासत असल्याने भीमा नदीच्या काठावरती खोदकाम सुरू होते. अचानकपणे एक आयताकृती दगड समाधान दत्ता गायकवाड यांच्या दृष्टीस पडला. त्यावर कोरीव काम केल्याचे दिसले. त्यांनी आणखी खोदकाम केल्यावर पूर्ण आयताकृती काळ्या पाषाणावर प्राणी, मनुष्य ह्यांच्या प्रतिमा कोरल्याचे दिसून आले. पुढे संशोधनाअंती ते 'वीरगळ' असल्याचे दिसून आले आहे.

येथील वीरगळ ४.५ फूट उंचीचा, २ फूट रुंदीचा व १.५ फूट जाडीचा आहे. हा वीरगळ आयताकृती असून त्याच्या एकाच बाजूला कोरलेले आहे. येथील वीरगळ हा पहिला प्रकारातील म्हणजचे वीराच्या दगडावर चार खणात काही प्रसंग कोरलेले आहेत. 'गोधन स्वरूपातील वीरगळ' असल्याचे दिसून येते. त्यावरून मौजे चळे गावामध्येही पूर्वीच्या काळात एखादा वीर गाईंचे संरक्षण करत असताना धारातीर्थी पडला असल्याचे येथे सापडलेल्या वीरगळावरून निश्चित सांगता येते.

वीरगळ चार खणातील आहे. खालून असणाऱ्या पहिल्या खणात वीर हा ढाल व परशू (कुऱ्हाड) घेऊन लढाईसाठी चालला आहे. पाठीमागे पाच गाई आहेत. दुसऱ्या खणात प्रत्यक्ष लढाईचे दृश्य आहे. वीराच्या मागे दोन वीर असून, तेही लढाईसाठी सज्ज असल्याचे दिसतात. त्यांच्याही हातात ढाल आणि परशू आहे. हे वीर समोरच्या दोघांशी लढाई करत आहेत. ही लढाई गोधनासाठी झालेली असून त्यामध्ये वीर धारातीर्थी पडला आहे. वीराच्या डोक्यावर पगडी आहे, तर विरुद्ध बाजूच्या वीराच्या डोक्यावर कफनी किंवा रुमाल बांधलेला आहे. यावरून वीराची वेशभूषा वेगवेगळी असल्याचे दिसून येते.

तिसऱ्या खणात धारातीर्थी पडलेल्या वीराला चार अप्सरा खांद्याच्या साहाय्याने कैलासाकडे घेऊन जात आहेत. अनेक ठिकाणच्या वीरगळांवर दोन अप्सरा वीराला घेऊन जाणाऱ्या दिसतात; पण येथे मात्र चार अप्सरा आहेत, हे येथील वीरगळाचे एक वेगळेपण आहे. चार अप्सरा दाखविण्यामागचा उद्देश कदाचित येथील वीर प्रतिष्ठित असला पाहिजे. चौथ्या खणात म्हणजे सर्वांत वरच्या खणात शिवाच्या पिंडीची पूजा करणारा वीर आहे. येथेच अगदी उजव्या बाजूच्या स्त्रीच्या हातात चौरी आहे. वीरगळाच्या सर्वांत वरच्या बाजूला मंदिराच्या शिखरासारखा भाग कोरलेला आहे. त्याच्या दोन्ही बाजूला अस्पष्ट चंद्र-सूर्य आहेत. जोपर्यंत चंद्र-सूर्य उगवत आहेत, तोपर्यंत ह्या वीराचा पराक्रम सर्वत्र कायम टिकवून राहील, असाच काहीसा सांकेतिक अर्थ आहे. अशा स्वरूपातील कालक्रम असणारा वीरगळ म्हणजे त्या वीराचा जीवनपटच म्हणावे लागेल.

चळे येथील वीरगळाचे महत्त्व:

चळे येथे नव्याने उजेडात आलेला वीरगळ हा त्या गावच्या स्थानिक इतिहासाचे अस्सल अप्रकाशित साधन आहे. गोधन वीरगळामुळे पूर्वीच्या काळात आपल्याही गावातील वीर धारातीर्थी पडला असल्याची माहिती नव्याने लोकांना झाली आहे. येथील वीरगळ गोपालनासंदर्भातील असल्याने पूर्वीच्या काळातही येथे पशुपालक समाजाची वसाहत होती. वीर हा महत्त्वाचा असल्याचे येथील अप्सरांवरून दिसून येते. असा हा अप्रकाशित वीरगळ स्वरूपातील आयताकृती दगड शेकडो वर्षांपासून जमिनीत गाडलेला होता. तो आता गायकवाड कुटुंबाच्या परिश्रमातून उजेडात आला असल्याने चळे गावच्या स्थानिक इतिहासाला बळकटी आणणारा ठरणार आहे, असे निश्चितपणे नमूद करता येते.

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◆

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Iron Oxide based Nitrogen containing Polymer Nanocomposite as a Highly Selective , Quickly Recoverable and Reusable Ammonia Sensor

Manisha Bora [1,2], Pravin Adhav[1], Digamber Pawar [1], Vasant Chabukswar [1*]

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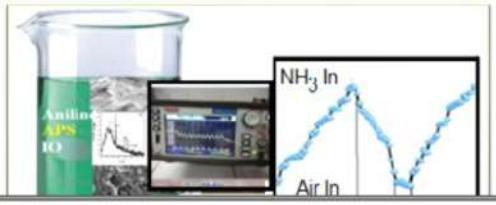

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कला व वाणिज्य महाविद्यालय, परळी वैजनाथ. जि.बीड

व मराठवाडा इतिहास परिषद यांच्या संयुक्त विद्यमानाने आयोजित

मराठवाडा इतिहास परिषद

३९ वे राष्ट्रीय अधिवेशन

(दि.६ व ७ डिसेंबर २०१९)

प्रमाणपत्र

मा.प्रा.डॉ. Ubale Keshav Kundalikrao. BJS college, Pune.

यांनी दि.६ व ७ डिसेंबर २०१९ रोजी न.शि.सं.राजूरीचे कला व वाणिज्य महाविद्यालय, परळी वैजनाथ जि.बीड द्वारा आयोजित केलेल्या मराठवाडा इतिहास परिषदेच्या ३९ व्या राष्ट्रीय अधिवेशनास उपस्थित राहून सत्राचे/परिसंवादाचे अध्यक्षस्थान/ Why suicidal tendency of farmers increased in Marathwada region of Maharashtra. या विषयावर शोधनिबंधाचे वाचन केले/सक्रिय सहभाग नोंदविला करिता प्रमाणपत्र देण्यात येत आहे.

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सावित्रीबाई फुले

प्रस्तावना

१९वे शतक हे भारतीयांच्या दृष्टीने प्रबोधनाचे शतक म्हणून ओळखले जाते. मध्ययुगीन काळातील पारंपरिक मूल्य नष्ट होऊन आधुनिकतेची कास धरणारी मानवतावादी, बुध्दीप्रामाण्यवादी, वैज्ञानिक दृष्टीकोन, स्वातंत्र्य, समता, बंधुता अशी आधुनिक मूल्य येथे रूजू लागली. त्याचाच एक भाग म्हणजे सामाजिक व धार्मिक सुधारणा चळवळीमधील विषेत: स्त्री सुधारणा चळवळ ही परिणाम कारक ठरली आहे. बाल विवाह, जरठकुमारी विवाह, सतीप्रथा, केशवपन, विधवाविवाहबंदी, भ्रूणहत्या, स्त्री शिक्षणबंदी अशा रूढीनंना वाचा फोडण्याचे कार्य पुरूषांप्रमाणेच स्त्रियांनी देखील केलेले आहे. त्यामध्ये सावित्रीबाई फुले, पंडिता रमाबाई, ताराबाई शिंदे, रमाबाई रानडे, काशिबाई कानिटकर, अवंतिकाबाई गोखले, मुक्ता साळवे अशा अनेक स्त्रिया प्रबोधनाच्या दृष्टीने उल्लेखनीय आहेत.

सावित्रीबाईंची प्रारंभीची जडणघडण :

एकोणिसाव्या शतकातील पहिल्या स्त्री शिक्षिका, शुद्रांना शिक्षणाची जाणीव करून देणाऱ्या, अनाथ मुलांची आई होणाऱ्या व उत्तम कवयित्री या सर्वांनी परिचित असणाऱ्या क्रांतिज्योती सावित्रीबाईंचा जन्म ३ जानेवारी १९३१ रोजी सातारा जिल्ह्यातील खंडाळा तालुक्यातील नायगाव येथे झाला.[१] आई लक्ष्मीबाई व वडील खंडोजी नेवसे पाटील होते. खंडोजींकडे नायगावच्या पाटीलकीचे अधिकार होते. सावित्रीबाई ह्या ९ वर्षाच्या असताना त्यांचा विवाह १३ वर्षे असणाऱ्या जोतीराव फुले ह्यांच्याशी झाला. त्यांनी बौध्दिक राजधानी असणाऱ्या पुण्यामध्ये येऊन समतावादी, मानवतावादी विचार रूजविण्याचे धाडसी कार्य केले. सावित्रीबाईंच्या सुधारणेची जडणघडण ही महात्मा फुलेंच्या सान्निध्यात आल्यानंतर झाली. अर्थात त्यासाठी त्यांनी पारंपरिकेतेची तोडलेली बंधने महत्त्वाची होती.

स्त्री शिक्षणाच्या पुरस्कर्त्या

अहमदनगर येथे अमेरिकन मिशनरी फेरारबाईंची मुलींची शाळा होती. महात्मा फुलेंचे मित्र सदाशिव बल्लाळ गोवंडे हे अहमदनगरमधील न्यायधिशाच्या कार्यालयात नोकरीस होते. त्यांच्या मदतीने महात्मा फुले व सावित्रीबाई फुले ह्यांनी फेरारबाईंच्या शाळेला भेट दिली. हा क्षण फुले दाम्पत्यांच्या जीवनाला कलाटणी देणारा ठरला आहे. सावित्रीबाई फुले यांनी महात्मा फुले, फेरारबाई व पुणे येथील मिसेस मिचेलबाई (नॉर्मल ट्रेनिंग स्कूलच्या प्रमुख) ह्यांच्याकडून शिक्षण घेतले.[२] महात्मा फुलेंना शिक्षणाचे महत्त्व अधिक वाटत होते. त्यांनी स्वत: *'शेतकऱ्यांचा आसूड'* या ग्रंथात नमूद केले की,

''विद्येविना मती गेली, मतीविना नीती गेली,

नितीविना गती गेली, गतीविना वित्त गेले,

वित्तविना शुद्र खचले, इतके अनर्थ एका अविद्येने केले''[३] अशी ही अविद्या दूर करण्याचा प्रयत्न त्यांनी पुढील शाळांव्दारे केलेला दिसून येतो. दिनांक १४ जानेवारी १८४८ रोजी महात्मा फुले यांनी पुणे येथे मुलींची पहिली शाळा सुरू केली. तिचा उल्लेख त्याच वर्षीच्या *'ज्ञानोदय'*मध्ये फुलेंची शाळा सुरू झाल्याचा उल्लेख आलेला आहे.[४] शाळा स्थापनेसाठी नानासाहेब भिडे यांनी शाळेला वाडा तर दिलाच पण त्याचबरोबर १०१ रूपयांची देणगी देखील दिली. शिवाय दरमहा ५ रूपये भेट म्हणून दिले. अशा पहिल्या शाळेत शिकविण्याचे कार्य प्रामुख्याने वयाच्या १७ व्या वर्षी सावित्रीबाई फुले करत होत्या. एवढ्या लहान वयात सनातन्यांचा रोष पत्करून त्या विरोधात केलेले बंड हे स्त्री शिक्षणाच्या दृष्टीने पहिले क्रांतिकारक पाऊल ठरलेले आहे.

सावित्रीबाईंच्या पहिल्या शाळेत पहिल्या दिवशी ६ मुली शिक्षण घेऊ लागल्या त्या म्हणजे -

१. अन्नपूर्णा जोशी - वय ५ वर्षे

२. सुमती मोकाशी - वय ४ वर्षे

३. दुर्गा देशमुख - वय ६ वर्षे

४. माधवी थत्ते - वय ६ वर्षे

५. सोनू पवार - वय ४ वर्षे

६. जनी करडिले - वय ५ वर्षे[५]

वरील मुली ह्या एकाच जातीतील नसून बाम्हण ४, धनगर १ व मराठा १ अशा वेगवेगळ्या जातीतील असल्याने सावित्रीबाई फुले यांनी आपल्या शिक्षणातून सर्वधर्मसमभाव तत्त्वाचा पुरस्कार केलेला होता. सन १८४८ ते १८५२ या चार वर्षात पुणे व परिसरात शाळांची संख्या १८ झालेली होती. दिनांक १६ नोव्हेंबर १८५२ रोजी ब्रिटिश सरकारने जोतिराव व सावित्रीबाई फुले यांचा गौरव केलेला होता. त्यावेळी फुलेंनी आपल्या शाळांचे सर्व श्रेय सावित्रीबाईंना दिलेले होते. फुलेंनी शाळांबरोबरच नेटीव्ह फिमेल स्कूल, दि सोसायटी फॉर प्रमोटिंग दि एज्युकेशन ऑफ महारास् मांग्ज अँड एक्सेट्राज, ह्या संस्थाची पुणे येथे स्थापना केली होती. संस्थांच्या कार्यातही सावित्रीबाई फुलेंचा असणारा सहभाग महत्त्वाचा होता.

फुले दाम्पत्यांच्या शाळेचे वैशिष्ट्ये म्हणजे १२ फेब्रुवारी १८५३ रोजी २३७ मुलींची वार्षिक परीक्षा ही पुना कॉलेजमध्ये घेण्यात आली.[६] त्यावेळी मुली पेपर कशा सोडवितात हे पाहण्यासाठी कॉलेजच्या परिसरात ३०० हून अधिक लोक जमा झालेले होते. त्यामध्ये ब्रिगेडियर ट्रायडेल, त्यांची पत्नी इ.सी. जोन्स, पुना कॉलेजचे प्राचार्य मेजर कॅन्डी, प्राध्यापक फ्रेझर, प्राध्यापक केरो लक्ष्मण हे देखील उपस्थित होते.[७] प्रथम क्रमांक मिळविणाऱ्या मुलीने इंग्रजीत मागणी केली की, 'आम्हाला खाऊ, खेळणी, कपड्यांचे बक्षिस नको. आम्हाला शालेय ग्रंथालय पाहिजे.' तिच्या मागणीवरून फुलेंनी तत्काळ शालेय ग्रंथालय सुरू केले ते भारतातील पहिले शालेय ग्रंथालय आहे. जोतिराव व सावित्रीबाई फुले ह्यांच्या स्त्री शिक्षण विषयक कार्याची दखल ब्रिटिश सरकारने घेतली. त्यांचा विश्रामबागवाड्यावर गौरव केला. याच दरम्यान पुना कॉलेजचे प्राचार्य मेजर कँडी यांनी फुलेंच्या कार्याचे कौतुक करून शाळेच्या आर्थिक मदतीसाठी सरकारकडे अर्ज केलेला होता. अशा स्वरूपात सावित्रीबाई फुलेंचे शैक्षणिक कार्य सुरू असतानाच जागतिक स्तरावर कार्ल मार्क्सचा कम्युनिस्ट जाहीरनामा प्रसिद्ध (१८४८) झाला. अमेरिकेतील न्युयार्क येथे स्त्री उद्धाराची चळवळ सुरू, फ्रान्समध्ये मानवी हक्कासाठी सुरू झालेली क्रांती व इंग्लंडमध्ये स्त्री स्वातंत्र्याची होऊ लागलेली मागणी ह्या सर्व घटनांपेक्षा फुले दाम्पत्यांनी सुरू केलेली मानवमुक्ती चळवळ श्रेष्ठ ठरते.

सावित्रीबाईंच्या शाळेतील विद्यार्थ्यांनी

सावित्रीबाई फुलेंची शाळा ही केवळ शिक्षण देणारी नव्हती तर ती स्त्रियांमध्ये पारंपरिकतेच्या विरोधात क्रांतिची बीजे रूजविणारी होती. पुण्यातील शाळेत फुलेंच्या चौथीच्या वर्गात शिकणारी मातंग समाजातील मुक्ता साळवी या १४ वर्षाच्या मुलीने स्त्रियांच्या दु:खांना वाचा फोडणारा निबंध प्रथम शाळेत

आलेल्या पाहुण्यापुढे वाचून दाखविला होता.[८] त्यानंतर तो १५ फेब्रुवारी १८५५ मधील *'ज्ञानोदय'*मध्ये प्रसिद्ध झाला. त्यामध्ये ती लिहिते, *''ज्यावेळी आमच्यातील स्त्रिया बाळंत होतात त्यावेळेस त्यांच्या घरावर छप्परसुध्दा नसते. म्हणून हीव, पाऊस व यांच्या उपद्रवामुळे त्यांस किती दु:ख होत असेल बरे? याचा विचार स्वत:च्या अनुभवावरून करा. याचा एखाद्या वेळेस त्यांस बाळंतरोग झाला तर त्यास औषधास व वैद्यास पैसा कोठून मिळणार? असा कोणता तुम्हांमध्ये संभावीत वैद्य होता की, त्याने लोकांस फुकट औषधे दिली!''* [९] याशिवाय समाजातील उच्चभ्रू लोकांकडून मातंग समाजावर होणाऱ्या अन्यायाबद्दल ती म्हणते, *'' मांग लोकांसाठी पुण्यात एकही विहीर नव्हती. पाण्यासाठी त्यास दररोज पराकाष्ठेचे श्रम करावे लागत असत. टोळच्या कवड्या द्याव्या तेव्हा त्यास कोणी शूद्र घागरभर पाणी देत. तेहि भला पक्का तास, पाऊण तास रखडल्या शिवाय मिळत नसे.''* [१०] मुक्ताने सामाजिकते वास्तव आत्मसात करून ते प्रत्यक्ष मांडण्याचे धैर्य दाखविले आहे. तिने हालआपेष्टांचे केलेल वर्णन डोळ्यात पाणी आणणारे तर आहेच पण सत्याला आरपार भिडणारे व वर्चस्वी वर्गाला आव्हान देणारे देखील आहे.

ताराबाई शिंदे यांचा *'स्त्री-पुरूष तुलना'* हा ग्रंथ सन १८८२ मध्ये प्रसिद्ध झाला. स्त्रियांवर होणाऱ्या अन्यायाला पुरूषत्वाचे वर्चस्वच जबाबदार आहे असे सांगताना त्या जहालपणे टिका करताना दिसतात. ताराबाईचे लेखन तत्कालिन समाजाला अस्वस्थ करणारे होते. पुरूषी वर्चस्वावर त्यांनी घणाघाती हल्ले केले होते. जोतिराव व सावित्रीबाई फुलेंच्या विचारातून जडणघडण झालेली तान्हूबाई बिर्जे ही भारतातील पहिली महिला संपादक (१९०६) झाली. रामोशी समाजातील सावित्रीबाई रोडे हिने *'रामोशी समाचार'*मधून दलितांच्या दु:खांना वाचा फोडतानाच सत्यशोधक चळवळीचे काहीसे नेतृत्व देखील केले आहे.[११] ही सर्व उदाहरणे ज्या काळात स्त्रियांना लिहिण्याचे, बोलण्याचे, विचार स्वातंत्र्य नव्हते त्या काळात वरील सर्वांनी निर्भीडपणे केलेले लेखन, मांडलेले विचार हे क्रांतिपेक्षाही श्रेष्ठ होते.

स्त्रीदास्यमुक्तीच्या आद्यप्रणेत्या

सावित्रीबाई फुले ह्या स्त्री व अपृश्य वर्गाच्या शिक्षणाबरोबरच सामाजिक सुधारणेच्या कार्यातही सहभागी होत्या. सावित्रीबाईंनी स्त्रियांची सुधारणा करण्यासाठी महिला सेवा मंडळाची स्थापना केली. या संस्थेच्या अध्यक्षा पुण्याचे कलेक्टर ह्यांची पत्नी मिसेस इ.सी.जोन्स होत्या. तर सेक्रेटरी सावित्रीबाई फुले होत्या. या सेवा मंडळामार्फत १३ जानेवारी १८५२ रोजी मिसेस जोन्स यांच्या अध्यक्षतेखाली सार्वजनिक तिळगूळ समारंभ आयोजित करण्यासंदर्भात छापील पत्रिका काढली होती. समारंभास सर्वजातीधर्मातील स्त्रिया एकत्र बसतील व सर्वानी एकमेकींना हळदीकुंकू लावून तिळगूळ वाटण्यात येई.

या आर्थाचा मजकूर होता. या समारंभामध्ये प्रचंड स्त्रियांनी सहभाग घेतल्याने जातिभेद निर्मूलन चळवळीस एका अर्थाने सुरूवात झाली होती.[१२]

समाजात बाल विवाह प्रथा प्रचलित होती. पतीच्या निधनानंतर पत्नीला विधवापण येणे म्हणजे नरक यातना सोसण्यासारखेच होते. तेव्हा अशा विधवांचा पुनर्विवाह होण्यासाठी अनेकांनी पुढाकार घेतला. जोतिराव व सावित्रीबाई फुले ह्यांच्या साक्षीने सन १८६४ मध्ये पुण्यातील गोखले बागेत सारस्वत जातीतील विधवेचा पुनर्विवाह झाला.[१३] विधवांची स्थिती ही अमेरिकेतील निग्रोपेक्षाही वाईट होती. सर्व सुखांपासून त्यांना दूर ठेवले जात होते. एवढेच नव्हे तर तिला गुन्हेगारापेक्षाही व जनावरांपेक्षाही वाईट वागणूक दिली जात होती. तारूण्यातील एखादी विधवा वासनेच्या आहारी गेली किंवा तिची फसवणूक करून शारीरिक संबंध आता तर ती गरोदर राहत होती. अशा अवस्थेत ती बाळाचा जीव घेत व स्वत:ही जीव देत. असे करण्याशिवाय तिला गत्यंतरच नव्हते. अशा स्त्रियांचा व बाळाचा जीव वाचण्यासाठी फुले दाम्पत्याने आपल्या स्वत:च्या घरात बालहत्या प्रतिबंधकगृह सुरू (१८६३) केले. हे गृह सुरू होण्यास पुण्यातील काशीबाईच्या खटल्याचे कारण होते. जोतिरावांचे मित्र गोवंडे यांच्या घरी काशीबाई ही ब्राम्हण विधवा स्वयंपाक करण्याचे काम करीत होती. शेजारच्या शास्त्रीबुवाने तिला फसविले. त्यातून ती गरोदर राहिली. गर्भपाताचे सर्व प्रयत्न फसल्यानंतर तिने बदनामीच्या भितीने अर्भकाची हत्या केली. तिच्यावर खटला भरला. तिला शिक्षा झाली. अशा स्त्रियांना आधार देण्यासाठी फुले दाम्पत्यांनी बालहत्या प्रतिबंधक गृह सुरू केले. आपल्या घरातील बालहत्या प्रतिबंधक गृहातील ३५ ब्राम्हण विधवा स्त्रियांचे बाळंतपण स्वत: सावित्रीबाई फुलेंनी केलेली आहेत.[१४] फुले दाम्पत्याने बालहत्या प्रतिबंधक गृहातील एका विधवेच्या मुलाला म्हणजेच यशवंतला दत्तक घेतले. पुढे त्याला डॉक्टर केले.

विधवा स्त्रियांना विद्रूप करण्यासाठी केशवपन केले जात होते. इच्छेशिवाय त्यांना बळजबरीने न्हाव्यापुढे बसवून केशवपन करावे लागत होते. ही प्रथा बंद करण्यासाठी न्हाव्यांचा संप घडवून आणण्याची कल्पना सावित्रीबाईंची होती. सन १८६५ मध्ये पुण्याजवळील तळेगाव ढमढेरे येथे न्हाव्यांचा संप झाला होता. असा न्हाव्यांचा संप देशातील पहिला संप ठरला आहे.[१५] या संपाने अनेक विधवांची केशवपनाच्या संकटातून मुक्तता झाली. या कार्याचे प्रतिबिंब पुढे ह.ना. आपटे यांच्या सन १८९६ मध्ये लिहिलेल्या *'पण लक्षात कोण घेतो'* या कांदबरीतून दिसून आले आहे.

सतीप्रथा ही स्त्रियांच्या दृष्टीने अत्यंत हीन दर्जाची प्रथा होती. पती निधनानंतर स्त्रिया सती जात होत्या. पण पत्नी निधनानंतर मात्र एकही पुरूष 'सता' गेल्याचे उदाहरण आढळत नाही असा उल्लेख

आवर्जून महात्मा फुले करतात. याशिवाय पुरूष अनेक स्त्रियांबरोबर लग्न करतो त्या सर्वजणी एकाच कुटुंबात 'सवती' म्हणून एकत्र नांदतात. पण त्या पुरूषाच्या पत्नीने दुसऱ्या पुरूषाशी लग्न करून त्यास आपल्या घरी आणले तर 'सवता' म्हणून ते पुरूष एकत्र राहू शकत नाहीत. या दोन्ही ठिकाणी पुरूषांचीच मक्तेदारी असून त्याखाली अनेक वर्षापासून स्त्रिया दबलेल्या होत्या.[१६] अशा स्त्रियांमध्ये बंड करण्याची धारणा सावित्रीबाईंनी निर्माण केलेली होती.

सत्यशोधक चळवळीचे नेतृत्व

महाराष्ट्रातील समाजसुधारणेच्या चळवळीत संस्थात्मकदृष्ट्या पहिली क्रांती करण्याचे कार्य महात्मा फुलेंच्या सत्यशोधक समाजाने केलेले आहे. दिनांक २४ सप्टेंबर १८७३ रोजी पुणे येथे सत्यशोधक समाजाची स्थापना झाली.[१७] संस्थेचे पहिले अध्यक्ष व खजिनदार महात्मा फुले होते. तर कार्यवाहक नारायण गोविंदराव कडलक होते. *'सर्वसाक्ष जगत्पती त्याला नको मध्यस्थी'* हे ब्रीद वाक्य आहे. महात्मा फुले यांच्या निधनानंतर सत्यशोधक चळवळीचे नेतृत्व सावित्रीबाईंनी केले. त्यांना हे कार्य करण्याचे बाळकडू महात्मा फुलेंच्या काळातच मिळाले होते. सन १८७६ साली दुष्काळ पडला त्यावेळी सावित्रीबाईंनी महात्मा फुले यांना लिहिलेले पत्र फार अर्थपूर्ण होते.[१८]

ओतूर, जुन्नर

२० एप्रिल १८७७

सत्यरूप जोतीबा स्वामी यास,

सावित्रीचा शिरसाष्टांग दंडवत

पत्रास कारण की गेले १८७६ साली लोटल्यानंतर दुष्काळाची तीव्रता वाढून सर्वजण व जनावरे चिंताक्रांत होऊन गतप्राण होत धरणीवर पडू लागली आहेत. माणसांना अन्न नाही, जनावरांना चारापाणी नाही. यास्तव कित्येक देशांतर करून आपले गाव टाकून जात आहेत. असे इकडचे भयानक वर्तमान आहे.

सत्यशोधक मंडळींनी या भागात लोकास अन्न धान्य पुरविण्यास्तव धीर देण्यास्तव दुष्काळनिवारण कमिट्या स्थापल्या. भाऊ कोंडाजी व त्यांच्या उमाबाई मला जीवापलीकडे सांभाळतात. ओतूरचे शास्त्री गणपती सखाराम डुंबरे पाटील वगैरे आपल्या समाजाचे सत्यशोधक तुम्हांस भेटण्यासाठी येणार आहेत. रा.ब.कृष्णाजी पंत लक्ष्मणशास्त्री हे आपणास विश्वासू आहेत. त्यांनी माझ्या समवेत दुष्काळी गावात जाऊन दुष्काळाने हैराण झालेल्या लोकांना द्रव्यरूपाने मदत केली. दुसरी चिंतेची बाब अशी की सावकारांना लुटावे, त्यांची नाके कापावीत अशी दुष्ट कर्मे या भागात घडत आहेत. हे श्रवण

करून कलेक्टर येथे आला. ५० सत्यशोधक पकडून नेले. त्याने मला बोलविले. तेव्हा मी उत्तर केले की आमच्या लोकांवर आळा व कुभांड घेऊन कैदेत ठेवले ते सोडा. कलेक्टर न्यायी आहे. तो गोऱ्या फौजदारास रागे भरून बोलला की, पाटील का दरोडे घालतात? त्यांना सोडून दे कळवळून त्याने आपल्या केंद्रात ज्वारीच्या चार गाड्या पाठविल्या आहेत.

सावित्री जोतिबा

वरील पत्रावरून दुष्काळाची दाहकता दिसून येते. तेथे सावित्रीबाईंनी केलेले कार्य महत्त्वाचे आहे. यामुळेच पुढील काळात त्या सत्यशोधक समाजाव्दारे कार्यरत राहिल्या होत्या. सन १८९३ मध्ये सासवड येथे भरलेल्या सत्यशोधक समाजाच्या २० व्या परिषदेच्या त्या अध्यक्षा होत्या.[१९] त्यांनी पुरंदर, जन्नर भागात फिरून लोकांना भट पुरोहितांकडून होणाऱ्या त्रासाची, धार्मिक छळाची माहिती देत होत्या. इंदापूर तालुक्यात सत्यशोधक समाजाची शाखा सुरू केली.

सावित्रीबाईंचे साहित्य

सावित्रीबाई ह्या उत्तम साहित्यिक होत्या. त्यांचा वयाच्या २३ व्या वर्षी *काव्यफुले* (१८५४) तर सन १८९२ मध्ये *बावन्नकशी सुबोध रत्नाकर* हे दोन काव्यासंग्रह प्रसिद्ध झाले.[२०] याशिवाय *ज्योतिबांची भाषणे* (१८५६), *सावित्रीबाईंचे ज्योतिबास पत्र*, *मातुश्री सावित्रीबाईंची भाषणे* (१८९२) इत्यादी साहित्य देखील प्रसिद्ध आहे.

सावित्रीबाई फुले यांचे निधन

महात्मा फुलेंच्या निधनानंतर सावित्रीबाईंना आर्थिक संकटांना तोंड द्यावे लागले. अशा संकटमय प्रसंगी १० फेब्रुवारी १८९२ रोजी बडोद्याचे सयाजीराव गायकवाड यांनी १ हजार रूपयांचा धनादेश तुकाराम तात्या पडवळ ह्यांच्या एस. नारायण कंपनीत गुंतविला. त्याच्या तिमाही ५० रूपये व्याजातून सावित्रीबाईंना मदत झाली. सन १८९६-९७ मध्ये प्लेगने अनेकांचा बळी घेतला. प्लेग पसरू नये म्हणून त्या गोऱ्या अधिकाऱ्यांना सूचना देत होत्या. ठिकठिकाणी हॉस्पिटल उभारण्यासाठी प्रयत्न करीत होत्या. ग्यानोबा ससाणे यांच्या वानवडी-घोरपडी परिसरात हॉस्पिटल उघडून मुलगा डॉक्टर यशवंतच्या मदतीने लोकांची सेवा करीत होत्या. मुंढवा येथील हरिजण वस्तीतल्या पांडुरंग बाबाजी गायकवाड या मुलाला प्लेगची लागण झालेली होती. त्याला हॉस्पिटलमध्ये घेऊन जात असातानाच सावित्रीबाईंना देखील प्लेगची लागण झाली. त्याचवेळी दिनांक १० मार्च १८९७ रोजी रात्री ९.०० वाजता सावित्रीबाईंचे निधन झाले.[२१]

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१९. डॉ. मा. गो. माळी व इतर (संपा.), पूर्वोक्त, पृ. ५८.

२०. कित्ता, पृ. १८३.

२१. कित्ता, पृ. १६२.

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चित्रमय जगतमधून प्रतिबिंबित होणारी रशियन राज्यक्रांतीव त्यानंतरची स्थिती

प्रस्तावना :

एकोणिसावे शतक हे भारतीयांच्या दृष्टीने सामाजिक-धार्मिक सुधारणा, राष्ट्रवाद, स्वातंत्र्य आंदोलन, वृत्तपत्रनिर्मिती व आधुनिकतेचा प्रारंभ निश्चित करणारे आहे. त्यामध्ये वृत्तपत्रव नियतकालिकांचे उल्लेखनिय योगदान आहे. लोकहिवादींनी 'बृहत्तर जिव्हा' असे वर्णन केलेल्या प्रारंभीच्या वृत्तपत्रांचे वैशिष्ट्ये म्हणजे ही वृत्तपत्रे ज्ञानाचा प्रसार व सामाजिक -धार्मिक सुधारणा घडवून आणणारी आहेत. महाराष्ट्राचा विचार केला तर बाळशास्त्री जांभेकरांच्या *दर्पण*नंतर *ज्ञानोदय*, *ज्ञानसिंधु*, *ज्ञानप्रकाश* व *ज्ञानचक्षू* ही वृत्तपत्रे ज्ञानाची माहिती दर्शविणारी होती. पुणे येथून प्रसिद्ध होणारे *'चित्रमय जगत'* हे एक स्वातंत्र्य चळवळीतील एक महत्त्वाचे मासिक होते.जून १९२८ मध्ये रशियाचा खास काढलेला अंक व त्यातील वैचारिक लेख हे भारतीय लोकांच्या बौध्दीकतेच्या दृष्टीनेमहत्त्वाचे होते. रशिया आणि भारताच्या दृष्टीने अंक महत्त्वाचा आहे.

'चित्रमय जगत' मासिकाचा मूळ संबंध 'चित्रशाळा' या छापखान्याशी आहे. इ.स. १८७९ मध्ये विष्णुशास्त्री चिपळूणकरांनी पुणे येथे चित्रशाळेची स्थापना केली.[१] चिपळूणकरांना 'स्वदेश, स्वधर्म व स्वभाषेचे रक्षण' हे सर्व महत्त्वाचे वाटत होते. त्यामधूनच पुढे त्यांना मासिकाच्या उद्याची प्रेरणा मिळाली. प्रारंभी छापखान्यातून देवादिकांची चित्रे व ऐतिहासिक पुरूषांच्या तसबिरी छापून दिल्या जात होत्या. त्यावेळी वासुकाका जोशी ह्यांचा विष्णूशास्त्रींच्या निबंधमालेशी संबंध आलेला होता. विष्णूशास्त्रींच्या मृत्यूनंतरमात्र चित्रशाळा छापखान्याची सर्व जबाबदारी वासुकाका जोशी ह्यांच्याकडे आली. वासुकाका प्रारंभी लोकमान्य टिळक व नंतर महात्मा गांधी यांच्या नेतृत्वाखालील आंदोलनात कार्यरत होते. विशेषत: पुणे जिल्ह्यातील त्यांच्या कार्याची माहिती डॉ. भूषण गोविंद फडतरे ह्यांच्या लेखन पुरस्कृत *भारतीय स्वातंत्र्यलढ्यात पुणे जिल्ह्याचे योगदान (इ.स.१९२० ते १९४७)* ह्या संदर्भ ग्रंथात विस्तृतपणे आलेली आहे. 'पुण्यातीलएक चळवळे गृहस्थ' अशी वासुकाकांची सर्वत्र ख्याती परसलेली होती.[२] त्यामुळे राष्ट्रीय नेते, क्रांतिकारक ह्यांचा चित्रशाळेशी संबंध येत असल्याने आता चित्रशाळा हा केवळ छापखाना राहिलेला नसून त्याला राष्ट्रीय संस्थेचे स्वरूप प्राप्त झालेले होते.

१. चित्रमय जगतची ओळख :

गणेश वासुदेव उर्फ वासुकाका जोशी यांच्या नेतृत्वाखाली जानेवारी १९१० मध्ये पुणे येथील चित्रशाळेव्दारे *'चित्रमय जगत'* मासिक सुरू झाले.[३] ते पुढे इ.स. १९६८ पर्यंत सुरू होते. याच दरम्याने सुरू झालेले *विविध ज्ञानविस्तार*, *लोकमित्र*, *मनोरंजन* ही मासिके मात्र चार दशकांपर्यंत आपले अस्तित्व टिकवून होती. पण *'चित्रमय जगत'* मात्र जवळजवळ सहा दशकांपर्यंत आपले अस्तित्व टिकवून होते. वरील सर्व मासिकांमध्ये चित्रे नसत अकारानेही लहान होती. परंतु वासुकाकांनी मात्र आपल्या मासिकात सचित्रे दिली. अंकाचा आकारही दुप्पटीने वाढविला. अशा पहिल्या *'चित्रमय जगत'* अंकाची जाहिरात ही दिनांक ६ डिसेंबर १९०९ *केसरी*च्या पहिल्या पानावर प्रसिद्ध केलेली होती. ती म्हणजे 'प्रत्येक महिन्याच्या पहिल्या आठवड्यात अंक प्रसिद्ध केला जाणार असून त्यामध्ये फोटोवरून तयार केलेली चित्रे, विनोदी चित्रे देत असल्याने *'चित्रमय जगत'* हे या अंकाचे वैशिष्ट्ये आहे. याशिवाय चरित्रे, स्थलवर्णने, नाटके, चर्चात्मक व टिकात्मक वर्णन अशा विषयांचाही समावेश केला जाणार आहे.'[४] अशा अर्थाच्या जाहिरातीवरून *'चित्रमय जगत'* हे मराठीतील पहिले सचित्र मासिक होते. प्रारंभीच्या काळातील *'चित्रमय जगत'*च्या अंकावर संपादकाचे नाव आढळत नाही. पण अंकाची सर्वस्वी जबाबदारी वासुकाका जोशींकडेच होती. पुढे *'चित्रमय जगत'*चे संपादक इतिहासाचार्य दत्तोपंत विष्णू आपटे (इ.स. १९१५ त १९२१), त्र्यंबक रघुनाथ देवगिरीकर (इ.स. १९२२ ते १९५०), रा. प्र. कानिटकर (इ.स. १९५० ते १९६८) इत्यादींनी संपादकत्वाची भूमिका पार पाडलेली आहे. पहिले संपादक आपटे हे इतिहास संशोधक व साहित्यकार होते. त्यांनी *भारत इतिहास संशोधक मंडळाचे त्रैमासिक*, *चित्रमय जगत*, *सह्याद्री*, *विविध ज्ञानविस्तार*, *ज्ञानप्रकाश* इत्यादी मासिकांमधून केलेले लेखन प्रभावी ठरलेले आहे. देवगिरीकर हे महाराष्ट्रातील काँग्रेसचे मुख्य कार्यकर्ते असून त्यांनी निर्भिड व नि:पक्षपाती लेखन केल्याने *'चित्रमय जगत'*ची ओळख राजकीय वृत्तीचे राष्ट्रीय मासिक म्हणून निर्माण झाली होती.

आधुनिक भारतावर आधारित चित्रमय जगतचे खास अंक/विशेषांक निघालेले आहेत. ते म्हणजे लोकमान्यांचे पुण्यस्मरण (१९२०), लष्करी खास अंक (१९३२), खास काँग्रेस अंक (१९३५), वासुकाका जोशी खास अंक (१९४५), महात्मा गांधी अंक (१९४८), स्वतंत्र भारताचे परराष्ट्र धोरण खास अंक (१९५०), काश्मिर खास अंक (१९५२), लोकमान्य टिळक विशेष अंक (१९५६), आठराशे सत्तावन विशेषांक (१८५७), सर्वोदय विशेषांक (१९५८), सीमा संघर्ष विशेषांक (१९६४), महाराष्ट्र राज्य निर्मिती विशेष अंक (१९६४), जवाहरलाल नेहरू विशेष अंक (१९६४) अशा अंकांमधून लिहिले गेलेले लेख हे आधुनिक भारताच्या इतिहासाबद्दल प्राथमिक स्वरूपाची माहिती देणारे आहेत.याशिवाय जागतिक स्तरावरील घडामोडींची माहिती भारतातील लोकांना होण्यासाठी खास अंक काढलेले आहेत. ते म्हणजे खास चीन अंक (ऑगस्ट १९२६), खास रशियाअंक (जून १९२८), खासस्पेन अंक (जानेवारी १९३८), खास जपान अंक (जानेवारी १९३६)

खास जर्मनी अंक (नोव्हेंबर १९३८), खास झेकोस्लोव्हाकिया अंक (जानेवारी १९२९), खास कोरिया अंक (जानेवारी १९५०), नवचीन विशेष अंक (जानेवारी १९५५), पाकिस्तान विशेष अंक (जानेवारी १९५९) खास अमेरिका अंक (जानेवारी १९६१) अशा अंकांपैकी स्वातंत्र्यपूर्व काळातील विविध देशातील राजकीय घडामोडींवर आधारित काढलेले खास अंक हे भारतातील लोकांना स्वातंत्र्यलढ्याची व विकासाची प्रेरणा देणारे होते. त्यामध्ये जून १९२८ मध्ये रशियाचा खास काढलेल्या अंकाचा उल्लेख करावा लागेल.

इ.स. १९६८ मध्ये *'चित्रमय जगत'* बंद झाले.[५] बंद होण्याचे कारण म्हणजे वासुकाकांनी हे मासिक जाहिरात न घेता सुरू ठेवले होते. त्यांनी आपल्या मृत्युपत्रातही तसे नमूद केले होते की, 'माझ्या पुर्वीच्या धोरणानेच चित्रमय जगत मासिक चालवावे. देशाच्या बदलत्या परिस्थितीच्या प्रश्नांची चर्चा मासिकात झाली पाहिजे.' वासुकाकांच्या मृत्युनंतर काही वर्षे संपादकांनी व विश्वस्तांनी त्यांच्या उद्देशानेच अंक चालविला पण पुढे मात्र वाढत्या खर्चामुळे अंकाचा ताळमेळ बसत नसल्याने जानेवारी १९६४ च्या अंकात *'चित्रमय जगत'* अंकाची वर्गणी सात रूपये केल्याचे जाहीर केले. वर्गणीदारांच्या संख्येत वाढ झाली नाही. अशा आर्थिक स्थितीमुळेच *'चित्रमय जगत'* मासिक बंद करावे लागले. हे मासिक बंद झाल्याचे दु:ख तत्कालिन संपादक रा. प्र. कानिटकर ह्यांच्या मनाला भिडणारे होते.

२. चित्रमय जगत खास रशिया अंकाचे महत्त्व - रशिया व भारत ह्या दोन्ही देशांच्या दृष्टीने चित्रमय जगत या खास अंकाचे महत्त्व दोन प्रकारे आहे. पहिले म्हणजे - रशियन राज्यक्रांतीला दहा वर्षे झाल्याच्या निमित्ताने भारतातील पुणे शहरामधील चित्रशाळा प्रेसने जून १९२८ चा *'चित्रमय जगत'चा* खास अंक काढला आहे. त्यामुळे रशियन राज्यक्रांतीची व त्यानंतरच्या दहा वर्षातील विकासाची माहिती झाली. दुसरे म्हणजे - समाजसत्तावादी विचारांचा प्रसार जगातील अनेक राष्ट्रांमध्ये होत होता. त्याचाच भाग म्हणजे भारतामध्ये मानवेंद्रनाथ रॉय व पंडित नेहरू यांनी समाजसत्तावाद आत्मसात करून त्यांची बीजे येथे रूजविण्यास सुरूवात केली होती. मानवेंद्रनाथ रॉय हे मॉस्को येथे १९२१ मध्ये भरलेल्या कम्युनिस्ट इंटरनॅशनलच्या दुसऱ्या मेळाव्याला उपस्थित होते. रॉय यांनी *गांधी आणि लेनिन* (१९२१), *संक्रमणावस्थेतील भारत आणि भारताची समस्या व त्यावरील उपाय* (१९२२) ही लिहिलेली पुस्तके भारतातील साम्यवादासाठी पुढील काळात उपयुक्त ठरत होती.[६] पंडित नेहरू हे नोव्हेंबर १९२७ मध्ये रशियन राज्यक्रांतीच्या दहाव्या वर्धापनास मॉस्कोतील कार्यक्रमास उपस्थित होते.[७] त्यांनी सन १८२८ मध्ये *सोव्हिएत रशिया* नावाचा ग्रंथ लिहिला. महाराष्ट्रातील श्रीपाद अमृत डांगे यांनी *'द सोशिऑलिस्ट'* नावाचे नियतकालिक सुरू केले. अशी समाजवादी विचारसरणी येथे रूजत असतानाच रशियाविषयी काढलेला अंक महत्त्वाचा होता. तो अंक चांगलाच गाजत होता. त्यामुळे चित्रशाळा व *'चित्रमय जगत'*वर पोलिसांची धाडपडली.

या प्रसंगीची घटना रा. प्र. कानिटकर यांनी *देवगिरीकर चरित्रा*मध्ये नमूद केल्याप्रमाणे 'पोलीस आले त्यावेळी देवगिरीकर तीन तास एका कपाटाला पाठ लावून उभे होते. अमेरिका व रशियातून आलेली साम्यवादी क्रांती संबंधीची पत्रे त्या कपाटात होती. त्यातील एका पत्रात *रक्तपाताशिवाय हिंदुस्थानात क्रांती होणार नाही* असा मजकूर होता.[८] पोलीस तेथे तपासणी करत होते तरी निर्भिडपणे देवगिरीकर त्या कपाटाला पाठ लावून उभेच होते हे त्यांचे कितीतरी मोठे कौशल्य होते.'

'चित्रमय जगत' अंकाच्या मुखपृष्ठावर लेनिनचे चित्र व कम्युनिष्ट पक्षाचे चिन्ह दिलेले आहे. तर मलपृष्ठावर रशियन राज्यक्रांती काळातील काही दुर्मिळ छायाचित्रे दिलेली आहेत. अंकात धर्म व ऐहिक मोक्ष - लेखक दत्तात्रय केशव केळकर, समाजसत्तावाद म्हणजे काय? - लेखक रामकृष्ण गोपाळ भिडे, रशियातील शिक्षण प्रयोग- लेखक केशव दत्त, रशियन राज्यक्रांतीचा इतिहास- त्र्यंबक रघुनाथ देवगिरीकर, सोव्हिएट रशियातील न्यायकचेऱ्या व फौजदारी कायदे, रशियातील सांप्रतची समाजव्यवस्था - श्रीनिवास विनायक गोरे, बोल्शेविझम, कम्युनिस्ट इंटरनॅशनल व राष्ट्रसंघ - एम.ए. डांगे, सोव्हिएटरशियाचे परराष्ट्रीय राजकारण- श्रीनिवास माधव दातार, बोल्शेविक त्रिमूर्ति- विनायक सुत व रशियाची गेली दहा वर्षाची आर्थिक प्रगती इत्यादी वैचारिक लेख दिलेले होते. याशिवाय इतर माहिती व छायाचित्रांची खास पुरवणी दिलेली आहे. भारत आणि रशियाच्या दृष्टीने महत्त्वाच्या *'चित्रमय जगत'* ह्या अंकाचे संपादक त्र्यंबक रघुनाथ देवगिरीकर होते.

३. 'चित्रमय जगत'मधून रशियाचा इतिहास :

३.१. धर्म व ऐहिक मोक्ष : रशियातील बोल्शेव्हिकांचे आद्य आचार्य कार्ल मार्क्सने नमूद केले की, ''धर्म हा गुलामगिरीचा विसर पडणारा मादक सुरा होय'' (Religion is Opium for the People).या मताची अमंलबजावणी करणाऱ्या धर्मगुरू व धार्मिक संस्थांना मिळणारे तनखे हे रशियन राज्यक्रांतीनंतर पूर्णपणे बंद झाले. धर्मास अनुसरून असणाऱ्या चळवळीस सरकारतर्फे कोणतेही खर्च करण्यात येणार नसल्याचे सरकारपातळीवर धोरण निश्चित झाले. हे सर्व रशियन राज्यक्रांतीचे फलित होते. गुलामगिरीच्या श्रृंखला तोडण्यास लागणारी वीर गती मारणारी व नेभळ आज्ञानधारकपणा उत्पन्न करणारी जी साधने सत्ताधाऱ्यांच्या उपयोगी पडतात त्यामध्ये धर्म हे एक प्रमुख साधन आहे. त्यामुळे जनतेच्या मनावरील धर्माची मादक छाप नष्ट झाल्याशिवाय गुलामगिरीतून सुटका होणार नाही.

धार्मिक बाबतीत समाजाची पुनर्घटना करण्यासाठी बोल्शेव्हिकांनी समतेच्या तत्वाचा पुरस्कार करताना धर्माच्या काही कल्पना ह्या मात्र प्रतिकूल असतात हे स्पष्टपणे मांडलेले आहे. धार्मिक दृष्टीने सुरू असलेली समाजाची सर्वव्यवस्था श्रीमंत - गरीब, स्वतंत्र - पारतंत्र, स्पृश्य - अस्पृश्य अशा विषमतेवर अधारलेली असून ती सनातन व ईश्वर निर्मित आहे. त्यामुळे तिला येथे विरोध नकरता स्विकार करून चांगले काम केले तर आपणास मोक्ष प्राप्त होऊन स्वर्ग प्राप्ती होते.

अशी विचारसरणी समाजात रूजविली जात होती. म्हणूनच अशा धार्मिक विचारसरणीस बोल्शेव्हिकांनी मादक सुरेची दिलेली उपमा ही महत्त्वाची आहे.

''नाही तुझी चाड आम्हा छत्रपति''[१] असे उध्दारणाऱ्या तुकाराम महाराजांच्या काळातील काही संतांना स्वातंत्र्याची चाड नव्हती. मुस्लिमांनी धर्मभावना दुखावल्या ही खंत त्यांना वाटत होती पण स्वातंत्र्य मिळविण्याचे व्यावहारिक उपाय मात्र त्यांना मिळत नव्हते. त्यांची ईश्वरावर निष्ठा असून तोच आपल्याला राजकीय स्वातंत्र्य मिळवून देईल अशी त्यांची धारणा होती व ती येथील अनेकांनी अंगिकारली आहे' अशी ही धारणा बोल्शेव्हिकांच्या दृष्टीने 'धर्माला गुलामगिरीचा विसर पाडणारा मादक सुरा आहे. यावरून बोल्शेव्हिकांनी धर्माच्या श्रृखंला तोडल्या आहेत त्याचे अनुकरण भारतातील लोकांनी केले पाहिजे.

३.२. समाजसत्तावाद म्हणजे काय? : ग्रीस लोकांचा साम्रज्यविस्तार, अलेक्झांडरच्या स्वाऱ्या, चेंगिझखानाच्या स्वाऱ्या ह्या घटना जरी वेगवेगळ्या काळातील असल्यातरी त्यांच्या पाठीमागील हेतू हा आर्थिक लढा, लूट व संपत्ती हेच होते.समाजसत्तावाद शास्त्राचा आद्यप्रवर्तक रूसोने पहिला सिध्दांत मांडला की, 'समाजरचना ही लोकसंमतीने व सहकार्याने झालेली असते. समाजाच्या हितसंवर्धनासाठी समाजानेच राज्य व शासन पद्धती ही निर्माण केलेली असते. त्यामध्ये काठेही श्रेष्ठ कनिष्ठ असा भेदभाव नसतो. एखाद्याने जर अरेरावी केली, सत्तेच्या जोरावर जुलुम केला तर त्यास अधिकाराच्युत करण्याचा अधिकार समाजाचा आहे.' अशा स्वरूपाचा समाजसत्तावादाचा सिध्दांत रूसोने *Lacontract Social* या ग्रंथात मांडलेला आहे.ह्या सिध्दांताचे बीज प्रथम फ्रान्समध्ये पेरले व कालांतराने ते जागतिक स्तरावर लोकशाहीच्या माध्यमातून विस्तृत झाले.

रूसोनंतर कार्ल मार्क्सचे तत्वज्ञान सर्वश्रेष्ठ ठरले असून ते प्रत्यक्ष कृतीत उतरवून त्याची सत्यता पटविणारा रशियन समाजसत्ता प्रस्थापित करणारा निकोलाय लेनिन आहे. लेनिन स्वत:ला मार्क्सचा अनुयायी समजत होता. कार्ल मार्क्सने लंडन येथे कम्युनिस्ट लीग नावाची संस्था स्थापन केली. या संस्थेमार्फतच कार्ल मार्क्सने इ.स. १८४८ मध्ये जग प्रसिद्ध असा जाहीरनामा प्रसिद्ध केला. जाहिरनाम्यातील तत्वे ही इ.स. १९२८ मधील जूनच्या *'चित्रमय जगत'* या अंकात दिलेली आहेत. तत्वांचे सार हे मानवतावादी, समानतावादी, राष्ट्रमालकी हक्क इत्यादींवर अधारलेली असल्याचे दिसून येते.

लेनिनने आपले तत्वज्ञान *State and revolution* ह्या ग्रंथात मांडले आहे.त्यामध्ये सरकार या संस्थेच्या उगमाबद्दल लेनिनचे मत लक्षात घेण्यासारखे आहे. समाजात शांतता नांदण्यासाठी 'सरकार' ह्या संस्थेचा उगम झाला आहे. बलिष्ठाच्या जुलमाने गांजलेल्यांनी आपल्या दु:ख मुक्तीसाठी प्रसंगी सशस्त्र उपायाने त्या जुलमी संस्थेला उलथून टाकणे हा मार्ग देखील योग्य आहे.

लेनिनच्या या मताला मार्क्सचाही पाठिंबा होता. दिनांक ७ ऑगस्ट १९१७ रोजी लेनिनने कामगार वर्गाच्या सत्तेची स्थापना केली. रशियात राज्यक्रांती झाल्यावर लेनिनने जी कार्यपद्धती सुरू केली होती ती पुर्वी इ.स. १८८१ साली झालेली फ्रान्समधील राज्यक्रांती ही मार्क्सच्या तत्वज्ञानावर आधारित होती. पॅरिसमधील कम्युनची पद्धत जरी अल्पकाळ ठरली असली तरी ती समाजसत्तावाद्यांच्या प्रयोगशिलतेच्या दृष्टीने महत्त्वाची होती. ह्याच पद्धतीचा अवलंब पुढे लेनिनने रशियात केला.

लेनीनने 'कम्युनिस्ट पार्टी ऑफ दि बोल्शेव्हिक' या पक्षाची स्थापना केली. सन १९१९ मध्ये मॉस्को सेथे भरलेल्या राष्ट्रीय कम्युनिस्ट परिषदेत १८४८ सारखाच जाहीरनामा काढला होता. भांडवलशाहीच्या जुलमाने ग्रासलेल्या कामगारांचे कल्याणाकडेअधिक लक्ष, पहिल्या महायुध्दाची कारणमीमांसा करताना भांडवलशाहीच्या आक्रमकतेमुळेच युध्द घडून आले. त्याची बीजे युरोपतच आहेत. तेव्हा तेथील भांडवलशाहीचे उच्चाटन झाल्याशिवाय भावी वर्गकलह थांबणार नाही.[१०] असा वैशिष्ट्यापूर्ण जाहीरनामा हा भारतीयांच्या दृष्टीने देखील प्रेरणादायी होता.

३.३ रशियातील शिक्षणप्रयोग : केशव दत्त यांनी रशियातील प्रत्यक्ष शिक्षण संस्था, शिक्षणतज्ज्ञ ह्यांना भेटी दिलेल्या होत्या. ब्रिटिश ट्रेड युनियनचे शिष्टमंडळ व अमेरिकेतील शिक्षणप्रेमी लेखक स्कॉट नियरिंग यांच्या अहवालावरून रशियातील शिक्षणविषयक धोरण हे जगातील सर्वांत मोठी प्रयोगशील शाळा असल्याचे नमूद केले आहे. रशियन राज्यक्रांतीच्या पुर्वी झारच्या काळात शिक्षण हे ठराविक प्रतिष्ठित लोकांनाच देण्याचे धोरण होते. सर्वांना शिक्षण दिले तर सत्तेला धोका हा त्याच्या पाठीमागील हेतू होता. त्यामुळे समाजात १०% साक्षर तर ९०% निरक्षर होते. पण रशियन राज्यक्रांतीनंतर मात्र स्थापन झालेल्या सरकारने वरील धोरणाच्या उलटकरून दाखविले. शाळांमध्ये राष्ट्राच्या ध्येय धोरणांना मूर्तस्वरूप देण्यावर भर दिला. विद्यार्थ्यांना पारंपरिक विषयाचे ज्ञान देण्यापेक्षा व्यवहारिक प्रश्नसमुदाय स्वरूपाचे शिक्षण देण्यावर भर दिला. त्यामध्ये सृष्टिविज्ञान, उद्योगधंदे व समाजविज्ञान ह्या तीन क्षेत्रातील मूलभूत सिध्दांताचा समावेश केला. शिक्षण संस्थेच्या मुख्य चालक मंडळामध्ये शिक्षक, पालक, कारखान्याचे प्रतिनिधी, विद्यार्थी समाविष्ट असतात. एवढेच नव्हे तर मॉस्को येथील पेझेंट्स होम हे कामगार चळवळीचे एक मुख्य केंद्रस्थान होते. तेथे वाचनालय काढून झोपण्याची देखील सोय केली होती. थोडक्यात रशियन राज्यक्रांतीनंतर रशियाचा विकास घडवून आणताना व्यवहारिक शिक्षणावर अधिक भर दिला होता.

३.४. रशियन राज्यक्रांतीचा इतिहास : देवगिरीकरांच्या मते, 'रशियात क्रांतीचा उगम हा शंभर वर्षापासून झाला आहे. फ्रान्समधील लोक राजाविरूद्ध बंड करतात तर आपण का करू शकत नाहीत असा विचार रशियन सैन्यात आला. त्यामुळे रशियामध्ये पहिली चळवळ सुरू झाली.'

अलेक्झांडरच्या मृत्यूनंतर रशियाचा झार पहिला निकोलस झाला. दिनांक २७ डिसेंबर १८२५ रोजी तो राजनिष्ठेची शपथ घेणार होता. या समारंभाच्या प्रसंगी क्रांतिकारक सैनिकांनी पिटर दी ग्रेटच्य अश्वारूढ पुतळ्याजवळून बंडाला सुरूवात केली. परंतु सरकारच्या बंदुका व तोफांपुढे बंडवाल्यांचा निभाव लागला नाही. निकोलसने बंडवाल्यांचे नेतृत्व केलेले पेस्टल, रायफेल व जुमिन ह्यांना फासावर दिले. १२० अधिकाऱ्यांना सैबेरियात हद्दपार केले तर सामान्य सैनिकांना तर चिरडून मारले. यातूनच फक्त राजसत्तेच्या बाजूने होते तेवढेच वाचले. या घटनेनंतर तर निकोलस 'मी देवाचा प्रतिनिधी, कधीही चूक करीत नसतो' या विचारानेच राज्यकारभार करू लागला. अलेक्झांडर हझेंग, तुर्गेनिव्ह, बाकुनिन ह्या साहित्यकारांनी साहित्यातून निकोलसच्या कारभारावर टिका केली. कोलोकोलच्या *'घंटा'* या मासिकाच्या हजारो प्रति रशियात येत होत्या.[११] हे सर्व साहित्य लोकांना क्रांतीची प्रेरणा देणारे होते.

निकोलसच्या नंतर दुसरा अलेक्झांडर सत्तेवर आला. त्याने गुलामगिरी नष्ट करण्याचा जाहीरनामा (१९ फेब्रुवारी १८६१), शेतकरी व जमीनदार यांच्या जमिनीचा प्रश्न, व्होलस्टा व झेमस्टो संस्थांची निर्मिती, फ्रान्स व इंग्लंडच्या धर्तीवर न्यायव्यवस्था निर्माण करण्याचा प्रयत्न अशा नव्या सुधारणा करण्याचा प्रयत्न केला. पण त्या सर्व अपयशी ठरल्याने लोकांचा रोष अधिक वाढला. क्रांतिकारकांच्या गावोगावी गुप्त संघटना स्थापन झाल्या. निहिलिझमच्या चळवळीने गती घेतली, स्वित्झरलँडमधील झुरीचे हे विश्वविद्यालय समाजसत्ताकवाद्यांचे केंद्रबिंदू होते. तेथून अनेकजण रशियात आले. क्रांतीची जागृती होऊ लागली. क्रापोटकीने मजुरात फिरून व्याख्याने दिली. सर्जिअस हा लाकडे कापन्याचा धंदा करीत आताना गावोगावी फिरून क्रांतीचा उपदेश करीत. ओबुचाफ हा जमीनादरी विरोधात व्याख्याने देत तर सोफिया ही मजुरांमध्ये जनजागृती करीत होती. अशी सर्वत्र क्रांतीची जानजागृती होऊन तिला सुरूवात झाली. सरकारने ही शेकडो लोकांन पकडून फाशी दिले. अनेकांना तुरूंगात टाकले तर कित्येकांना हद्दपार केले. अशी स्थिती रशियातील अनेक प्रांतात सुरू होती. झारने दडपशाही करण्याकरीता स्वतंत्र विभाग सुरू केला होता. दुसऱ्या अलेक्झांडर या झारला मारण्यासाठी क्रांतिकारकांनी योजना आखल्या होत्या. त्यानुसार ग्रीनेविटस्की या विद्यार्थ्यांने झारवर बाँब टाकला. त्यामध्ये विद्यार्थी व झार दोघांचाही मृत्यू झाला. सोफिया, पेरोस्किया, किवॉल्टशिटस व जेसी हेफमन ह्यांना फाशीच्या शिक्षा दिल्या. जेसी हेफमन ही गरोदर स्त्री असल्याने तिला तुरूंगात पाठविले[१२] तर इतरांना मात्र तत्काळ फाशी दिले.

तिसरा अलेक्झांडर नंतर दुसरा निकोलस सत्तेवर आला. तोही प्रजाहित दक्ष नव्हता. त्याच्या काळातही रशियात अनागोंदी सुरूच होती. फादर गपोनच्या नेतृत्वाखाली २२ जानेवारी १९०५ रोजी कामगारांचा मोर्चा निघाला असताना त्यावेळी झालेल्या गोळीबारात ३ हजार स्त्री पुरूषांचा मृत्यू झाला. याच दरम्यान जपान - रशियामध्ये युध्द होऊन त्यामध्ये रशियाचा पराभव झाला. झार हा

पत्नी झारीना व धर्मगुरू रासपुतीन ह्यांच्या पूर्ण आहारी गेला होता. लोकांमधील असंतोष वाढत जाऊन प्रसिद्ध अशी रशियन राज्यक्रांती झाली. क्रांतीनंतर जुरोव्हास्की अधिकाऱ्याने इकाटेरिंगबर्ग येथे २५ जुलै १९१८ रोजी झार, झारीना, मुलगा ॲलेक्स व चार मुली ह्यांच्यावर बंदिस्त खोलीमध्ये गोळ्या झाडल्या.[१३] लेनिनच्या झारशाहीचा अंत होऊन बोल्शेव्हिक पक्षाच्याव्दारे रशियात सत्ता स्थापन झाली.

३.५. सोव्हिएट रशियातील न्यायकचेऱ्या व फौजदारी कायदे : भांडवलशाही इंग्लंड व अमेरिका व रशियातील न्यायपद्धतीमध्ये फरक होता. तो म्हणजे भांडवलशाही राष्ट्रातील न्यायदेवता भांडवलदार, प्रतिष्ठीत व राज्याधिकारी वर्ग ह्यांना अनुकूल होती तर रशियामध्ये मात्र कामगार व शेतकरी वर्गाला अनुसरून असणारी न्यायदेवता ही सर्वांना सारखी न्याय मिळवून देणारी होती. रशियात सन १९२२ मध्ये न्यायकोर्ट स्थापन झाले. तेथील अधिकाराची सर्व कामे मजूरवर्ग व कामगार वर्ग करीत होते. रशियातील न्याय कचेरीस पीपल्स कोर्ट असे म्हणतात. न्यायाधीश एक असून एक वर्षासाठी निवड केली जात होती. त्याच्या मदतीस पंचाची ज्युरी दिलेली होती.तिला पीपल्स असेसर्स म्हणत होत. ज्युरीमध्ये पुरूषांरोबरच स्त्रियाही सहभागी होत्या हे रशियातील न्यायकेचरीचे वैशिष्ट्य होते. आपल्या देशाबद्दल कट कारस्थान करणे, कायद्यांचा भंग करणे हे गुन्हे समजले जात होते.समान्य गुन्हेगाराला सुधारण्याची संधी दिली जात होती. तर १० ते १५ वर्षापर्यंत तुरूंगवासाची शिक्षा दिली जात होती. रशियामध्ये दंड करण्याची पद्धत नव्हती. कारण दंडाची रक्कम श्रीमंत लोक भरून गुन्ह्यांमधून आपली सुटका करून घेतात. कोर्टामध्ये कर्तव्य बजावणारी Advaocates Unionनावाची वकीलाची संस्था होती. ती लोकांना मोफत कायद्याचे ज्ञान देत होती.

३.६. रशियातील सांप्रतची समाजव्यवस्था : रशियात राज्यक्रांतीनंतर समाजात मुख्यत: सधन व गरीब असे दोन वर्ग होते. या दोन्हींमधील भेद कमी करून समता निर्माण करण्यावर भर दिलेला होता. पुर्वीच्या काळात समाजात अमीर, उमराव, जमीनदार ह्या वर्गाचे शेतकरी, कामगार, गरीब लोक ह्यांच्यावर असणारे वर्चस्व नष्ट झाले.त्यामुळे आता सामान्य लोकांना चांगले जीवन जगता येऊ लागले. झारच्या काळात वर्चस्वी वर्गाला आवश्यक असणाऱ्या वस्तूंच्या निर्मितीवर भर दिला जात होता. पण आता मात्र वस्तू निर्मितीचा मुख्य केंद्रबिदू सामान्य माणूस गृहीत धरला. वस्तूंच्या किंमतीही कमी ठेवल्याने त्या सामान्यलोकांच्या अवाक्यात होत्या.

राज्यक्रांतीनंतर बोल्शेव्हिकांनी धार्मिकतेला कुठेही प्राधान्य दिले नाही. उलटस्वार्थी पाद्रीभटांच वर्चस्व नष्ट केले. पाद्री गुन्हेगारांना कडक शिक्षा दिल्या. चर्चमधील धार्मिक विधी, विवाह यांना बंदी घातली. विवाहाची सरकारी कार्यालयात नोंद करण्याचे धोरण तयार केले. लग्नानंतर वधूने आपले नाव बदलून नवऱ्याचे नाव घेतलेच पाहिजे असे बंधन नव्हते. घटस्फोटाच्या बाबतीतही प्रथम त्या दोघांची निती संबंध तपासून घेतल्यानंतरच निर्णय घेतला जात होता. राजकारणात व राष्ट्रहिताच्या

बाबतीत स्त्रिया ह्या पुरूषांप्रमाणेच सहभागी होत होत्या. उदा. लेनिनची पत्नी मॅडेम कामेनीव्ह ह्या युनियन ब्युरोच्या डायरेक्टर, मॅडम कुपस्कावा ह्या सोव्हिएट युनियन ब्युरोच्या डायरेक्टर होत्या. तर लेनिनच्या मंत्रिमंडळात अलेक्झांड्रा कलन्ताया होत्या.[१४] एकंदरीत राज्यक्रांतीनंतर रशियातील समाजव्यवस्थेत परिवर्तन घडवून आणण्याचे श्रेय बोल्शेव्हिकांना दिले जाते.

३.७. बोल्शेविझम : युरोपमध्ये समाजसत्तावाद, साम्यवादी तत्वज्ञान विस्तारलेले होते. या तत्वज्ञानास काही व्यावहारिक स्वरूप आणून देणारा पंथ म्हणजे 'बोल्शेविझम' होय. 'बोल्शेविझम' हा साम्यवादाचाच एक प्रकार आहे. अठराव्या शतकाच्या अखेरीस युरोपातील पश्चिमेकडील देशात जी यांत्रिक शक्ती उद्यास आली. तिच्यामुळे भांडवलदार व कामगार असे दोन भिन्न वर्ग निर्माण झाले. ह्या दोन्ही वर्गातील संख्याबळ व संपत्तीबळ ह्यामध्ये भरपूर फरक आहे. त्यांच्यातील विषमता वाढत जाऊन संघर्ष किती दिवस, वर्षे सुरू राहणार हे निश्चित सांगता येत नाही. रशियातील झार सत्तेला कंटाळून अनेकजण परदेशात जाऊन साम्यवादी तत्वज्ञान आत्मसात करीत होते. रशियन सोशालिस्ट पक्षाची सभा सन १९०३ मध्ये लंडन येथे भरली.[१५] तेथे साम्यवादावर झालेली चर्चा महत्त्वाची ठरली. ह्याच वर्षी लेनिनचा 'बोल्शेव्हिक पक्ष' स्थापन झालेला होता.

३.८. कम्युनिस्ट इंटरनॅशनल व राष्ट्रसंघ : सन १८७० च्या फ्रँको-जर्मन युध्दाच्या वेळी पॅरिस शहरावर कम्युनिस्टांनी ताबा मिळवून तेथे दोन महिने कम्युनची सत्ता स्थापन केली. पण फ्रेंच सैन्याने पॅरिसवर ताबा मिळवून त्यांची सत्ता संपुष्ठात आणली. पण ही कम्युनिस्ट इंटरनॅशनलची पहिली संस्था ठरली. पुढे सन १८८९ साली पॅरिस येथे दुसरीकम्युनिस्ट इंटरनॅशनल संस्थेची निर्मिती झाली.[१६] पुढे लेनिनने सन १९१६ मध्ये *State & Revolution* पुस्तक लिहिले. त्यामध्ये नमूद केले की, 'वा, वा, क्रांतिसंबंधी लिहिण्यापेक्षा प्रत्यक्ष क्रांती करणे हे किती तरी अधिक चांगले! चला करू या क्रांती!!'[१७] पुढच्याच वर्षीमध्ये(१९१७) हे विधान खरे करून दाखविले. सन १९१८ मध्ये रशियन कम्युनिस्टाच्या अमंत्रणावरून परिषद भरली. त्यामध्ये तिसऱ्या कम्युनिस्ट इंटरनॅशनल संस्थेचे नियम करण्यासाठी कमिटी करण्याचे निश्चित झाले. या संस्थेची दुसरी विश्वपरिषद इ.स. १९२० मध्ये मॉस्कोमध्ये भरली. तर इ.स. १९२१ मध्ये परत मॉस्को येथेच तिसरी विश्वपरिषद भरली. त्यामध्ये सर्व कारखान्यातून व वर्कशॉप्समधून कम्यनिस्ट पक्षाचे संघ स्थापन करण्याचे ठरले होते.

३.९. सोव्हिएट रशियाचे परराष्ट्रीय राजकारण : श्रीनिवास माधव दातार यांच्या मते, 'अठराव्या शतकातातील फ्रेंच क्रांतीची तत्वे रशियात विस्तारली नव्हती. कारण रशिया हा प्रगत राष्ट्रांच्या स्पर्धेत उतरलेला नव्हता. उलट इंग्लंड, फ्रान्स, जर्मनी, अमेरिका ह्या देशांनी व्यापारच्या दृष्टीने रशिया हे आपले केंद्रबिंदू मानले होते. यावेळी जरी राजकिय दृष्ट्या रशिया हा प्रगत असला तरी आर्थिकदृष्ट्या मात्र प्रगत राष्ट्रांवरच अवलंबून होता.' इंग्लंड, फ्रान्स व अमेरिका ह्या राष्ट्रांकडून रशियच्या झारने

काढलेले कर्ज हे त्याने आपली साम्राज्यतृष्णा तृप्त करण्यासाठीच वापरले होते. त्यामुळे सामान्य लोकांना इंग्लंड व फ्रान्स बद्दल फारशी जवळीकता वाटत नव्हती. पहिल्या महायुध्दाच्या प्रसंगी रशियाच्या झारची 'मेडीटरेनीयन् सी' वरील नाक्याचे कान्स्टॅन्टिनोपल हस्तगत करण्याची महत्त्वकांक्षा होती. पण त्यामध्ये जर्मनीचा अडथळा होता. रशियाचे सैन्य हे जर्मनीच्या सैन्यापेक्षा कमकुवत होते. दुसरे असे की, रशियाचे मित्र इंग्लंड व फ्रान्स हे जरी असले तरी ते रशियापासून दूर असल्याने ते फार काही करू शकले नाहीत. उलट रशियन जनता युध्दाला मदत देणारी नव्हती. त्यामध्ये अनेक ठिकाणी जर्मनीकडून रशियाचा पराभव होऊ लागल्याने तर लोकांचा झारवर असणारा रोष अधिकच तीव्र होत गेला. शेवटी झारला राज्यत्याग करावा लागला. लेनिन, ट्रॉटस्की सारख्या समाजसत्ताकवाद्यांनी लोकांना पटवून दिले की, 'युध्द प्रसंगी इंग्लंड, फ्रान्सला पाठिंबा देऊन काहीच फायदा तर नाहीच उलट त्यांना पाठिंबा देऊन पुन्हा गुलामगिरी बळकट करण्यासारखीच आहे.' असे नवमतवादी असणारे लेनिनचे धोरण हेच रशियाचा विकास करू शकेल असा लोकांना विश्वास होता त्यामुळे त्यांनी पाठिंबा दिला. इंग्लंड, फ्रान्स, अमेरिका, जर्मनी ह्या राष्ट्रांच्या सरकारवर प्रत्यक्ष व अप्रत्यक्ष भांडवलदार वर्गाचेच नियंत्रण असते. त्यामुळे भांडवलशाहीचे मूळच नष्ट करून बहुजनसमाजाच्या हिताचे राज्य करणारी सरकारे ठिकठिकाणी प्रस्थापित करण्यासाठी परराष्ट्रात निर्माण होणाऱ्या चळवळीस मदत करणे हे लेनिन व त्याच्या सहकार्यांनी सांगितल्याने तर लोकांचा अधिकच विश्वास बसला.

लेनिनने सत्ता स्थापन केली त्यावेळी रशियाची स्थिती अत्यंत बिकट होती. एका बाजूला इंग्लंड, फ्रान्सशी शत्रुत्व तर दुसऱ्या बाजूस जर्मन सैन्य रशियात आक्रमण करीत होते. पण जर्मनीची ही स्थिती फारशी चांगली नसल्याचे तेथील समाजसत्ताकवाद्यांकडून लेनिनला वार्ता कळत होत्या. त्यामुळे लेनिनने जर्मनीशी तह करण्याचा निर्णय घेतला. दिनांक ३ मार्च १९१८ रोजी ब्रेस्ट लिटोव्हस्क येथे रशिया व जर्मनी ह्यांचे प्रतिनिधींच्यात तह झाला. या तहाने रशिया- जर्मनी युध्द थांबले. यावेळी जरी रशियाचा अपमान झाला असलातरी पुढे त्यामध्ये यशस्वीपणा होता. त्यानंतर ऑस्टिया, हंगेरी, रूमानिया व फिनलंड ह्यांच्याशी तह करण्यात लेनिन यशस्वी झाला.[१८] महायुध्दातून रशिया एकाएकी बाहेर पडणे हे इंग्लंड व फ्रान्स ह्यांना मान्य होण्यासारखे नव्हते. त्याची जाणीव लेनिनला होती. ब्रेस्टलिटोव्हस्क तहानंतर रशियातील जर्मन सैन्य फ्रान्सच्या दिशेने गेले त्यामुळे फ्रान्सला धोका निर्माण झाला. रशियापासून इंग्लंड व फ्रान्सचा प्रदेश दूर असल्याने प्रत्यक्ष काही धोका नव्हता व अप्रत्यक्षही त्यांचे पुर्वीच्या झारशी असणारे संबंध व झारचे बरेच सैन्य युध्दामध्ये मारले गेले होते. नव्याने भरती केलेले सैन्य मजूर, शेतकरी वर्गातले होते. त्यांचीसमासत्तावादावर निष्ठा होती. त्यामूळे अप्रत्यक्ष देखील काही धोका नव्हता. अमेरिकेच्या हस्तक्षेपाने जर्मनी ऐवजी दोस्त राष्ट्रांचा विजय होणार हे लोकांना समजून येत होते. त्यामूळे जर्मनीत क्रांती होऊन सोशल डेमोक्रॅट पक्षाचे सरकार स्थापन झाले. त्यावेळी दोस्त राष्ट्रांशी झालेल्या

व्हर्सेल्सच्या तहावेळी जर्मनीचा अपमान झाला होता. अशा स्वरूपात जर्मनी व रशिया ही दोन्ही राष्ट्रे समदु:खी होती. त्यामुळे त्यांच्यात सलोखा निर्माण होणेसहाजिकच होते.

रशियाचा विकास घडवून आणण्यासाठी परराष्ट्रांची मदत घेणे महत्त्वाचे आहे हे ओळखून लेनिनने मार्च १९२१ मध्ये इंग्लंडशी व्यापारी तह केला. अर्थात पुर्वीच्या काळात रशियाशी सुरू असणारा इंग्लंडचा व्यापार आता बंद झाला होता. त्यामुळे इंग्लंडचेही मोठे नुकसान होत होते हे पंतप्रधान लॉईड जॉर्ज यांच्या लक्षात येत होते त्यामुळे त्यांनी रशियाशी तहाला मंजुरी दिली होती.

इ.स. १९२४ नंतर तर फ्रान्स, इटली, जपान, अफगणिस्तान, इराण व तुर्कस्थान ह्या राष्ट्रांशी रशियाने मित्रत्वाचे तह केले. आता फक्त अमेरिका राहिलेला होता. पुर्वीच्या काळात झारने अमेरिकेकडून मोठे कर्ज घेतलेले होते. झारच्यानंतर काही महिने स्थापन झालेल्या हंगामी सरकारने हमी घेतल्यानेच अमेरिकेने त्या हंगामी सरकारला मान्यता दिली होती. पण हंगामी सरकार जाऊन लेनिनची सत्ता स्थापन झाली. लेनिनने मात्र कर्जाची हमी घेतली नव्हती. त्यामुळे काही वर्षेतरी रशिया व अमेरिका ह्यांच्यातील संबंध सुधारले नव्हते. ते सन १९२५ च्या नंतर पूर्णत: बदलू लागले होते. अमेरिकेतील अनेक व्यापारी रशियाशी संबंध ठेवू लागले होते. त्यातूनच 'आमटोर्ग कंपनी' ही रशिया व अमेरिकन व्यापारी पेढी अमेरिकेत सुरू झाली. रशियातील 'व्होल्गा फॅमिन' या मोठ्या दुष्काळी प्रसंगी अमेरिकेने मोठी आर्थिक मदत दिली होती.[१९] थोडक्यात राज्यक्रांतीनंतर रशियाला पुन्हा आंतरराष्ट्रीय स्तरावर प्रतिष्ठा निर्माण झाली.

३.१०. बोलशेविक त्रिमूर्ती : रशियन राज्यक्रांतीचा आद्य प्रणेता लेनिन असून त्याचा उजवा हात ट्रॉटस्की तर डावा हात स्टॅलिन आहे. लेनिनचे मूळ नाव ब्लादिमीर इलिच उलिनाव्ह असे आहे. रशियातील लेना नावाच्या सोन्याच्या खाणीजवळ काही वर्षे राहिल्याने त्याचे नाव त्या खाणीवरून लेनिन असे झाले. लेनिनवर कार्ल मार्क्सचा प्रभाव पडलेला होता. त्याला क्रांतीची प्रेरणा ही भावाच्या फाशीपासून मिळालेली होती. झारच्या विरोधात कार्य केल्यामुळे त्याला सैबेरियात हद्दपार केले. तेथेच लेनिनने आपला प्रसिद्ध ग्रंथ *'The Development of the Capitalism in Russia'* *'रशियामधील भांडवलशाहीचा विकास'* लिहिला. योग्य वेळी रशियात येऊन ट्रॉटस्की व स्टॅलिनच्या मदतीने १९१७ मधील जानेवारीच्या ७ तारखेस बोल्शेव्हिक पक्षाची सत्ता स्थापन केली. शेवटपर्यंत कामगार, मजूर, शेतकरी ह्या वर्गासाठीच कार्य करीत राहिला.

लेनिननंतर ट्रॉटस्कीचे नाव घेतले जाते. ट्रॉटस्कीचे मूळ नाव लीऑन डेविडोविच ब्रॉनस्टीन असे आहे. ट्रॉटस्कीने साऊथ रशियन वर्कर्स युनियन नावाची संस्था काढली. संस्थेव्दारे समतावादाचे विचार शेतकऱ्यांमध्ये रूजवित असतानाच तुरूंगवासाची शिक्षा झाली. पुढे सैबेरियात हद्दपार केले. तेथून पुढे लेनिनच्या *'इस्क्रा'* नावाच्या वर्तमानपत्रात लेखन केल. लेनिनचा सेक्रेटरी म्हणून कार्य

करीत असला तरी त्याचे लेनिनशी वैचारिक मतभेद होत होते. ट्रॉटस्की हा अत्यंत जहाल, चंचल स्वभावाचा असल्याने लेनिनने आपला दुसरा शिष्य स्टॅलिनकडे रशियाची सुत्रे देण्याचे निश्चित केले असले पाहिजे. शेवटी तो सैबेरियात जीवन जगत होता.

लेनिनचा पट्टशिष्य व ट्रॉटस्कीचा विरोधी गुरूबंधू म्हणजे स्टॅलिन आहे. स्टॅलिनचे मूळ नाव जोसेफ विसारिओनोविच जुगाविली होय. त्याची देहयष्टी लोखंडासारखी धाडसी असल्यानेच लेनिनने त्याचे नाच स्टॅलिन असे ठेवले होते. वडिलांची इच्छा धर्मशास्त्र शिकून पाद्री व्हावे पण झाला क्रांतिकारक. रशियन राज्यक्रांतीच्या प्रसंगी लेनिनला मदत केली. मृदूस्वभावाचा पण कर्तव्यदक्षतेला महत्व देणारा व राष्ट्रहितासाठी सतत कार्यरत असणारा अशी स्टॅलिनची ओळख निर्माण झाली होती. त्यामुळे लेनिनने आपल्या मृत्यूनंतर स्टॅलिन हा सत्ताधिश असल्याचे निश्चित केले होते आणि पुढे ते सत्यात आले. अशा स्वरूपात ही लेनिन, ट्रॉटस्की व स्टॅलिन हे रशियाच्या इतिहासात बोलशेविक त्रिमुर्ती आहेत.[२०]

३.११. रशियाची गेली दहा वर्षाची आर्थिक प्रगती : रशियन राज्यक्रांतीनंतर स्थापन झालेल्या नव बोल्शेव्हिक सरकारने प्रथम युध्द थांबवून देशांतर्गत सुधारणांना प्राधान्य दिले. जमीनदारांची जमिनीवरील मालकी नष्ट करून त्या जमिनी शेतकऱ्यांना वाटून दिल्या. कारखानदारची मालकी संपुष्ठात आणून सर्व कारखाने राष्ट्राच्या मालकीचे केले. सर्व लहान लहान बँकांचे विलिनीकरण करून एकच राष्ट्रीयकृत बँक निर्माण केली. जमीनदारांचे वाडे जप्त करून ते गरीब लोकांना राहण्यास दिले. याशिवाय लेनिनच्या नव आर्थिक धोरणाने (New Economic Policy) सुधारणा घडवून येत होत्या. ह्या सर्वांमुळे रशियाच्या उत्पन्न निर्मितीत प्रगती झाली होती. ती खालील आकडेवारीमध्ये १०० (शेकडा) हे प्रमाणभूत मानून दिलेली आहे.[२१]

वर्ष	उद्योगधंदे	शेतकी
१९१३	१००	१००
१९१४	९२	९९
१९१५	१०२	१०३
१९१६	१०९	९८
१९१७	६९	९३
१९१८	३०	८४
१९१९	२४	७५
१९२१	१७	६१
१९२२	२६	५२
१९२३	३३	७१
१९२४	४६	७६

१९२५	६९	८२
१९२६	९६	९७
१९२७	१०९	१०१
१९२८	१२४	१०४

वरील आकडेवारीवरून प्रारंभची वर्षे व शेवटीच्या वर्षाची वाढ चांगली आहे. पण मध्यभागीच्या वर्षी मात्र कमी झाल्याचे दिसून येते. कारण नव सरकारला आपल्या सुधारणा राबविण्यास काहीसा अवधी लागला होता.

क्रांतिनंतर कारखाने राष्ट्राच्या मालकीचे केल्याने नियमावली सारखेपणा आला. सर्वांना कामाचे ८ तास निश्चित करण्यात आले. मजुरांना घरे, दिवाबत्ती, औषधे, मुलांना शिक्षण हे सर्व मोफत मिळाले. वर्षातून १५ सुट्ट्या मिळत होत्या. स्त्रियांना गरोदरपणात ३ महिने रजा मिळू लागली. ह्या सर्व सोई झारच्या काळात नव्हत्या. पण राज्यक्रांतीनंतर मात्र मिळू लागल्याने कामगारांची कामाची गती वाढली होती. परिणामी उद्योगधंदे व वस्तूची निर्मिती वाढू लागली. ती खालील आकडेवारीमध्ये १०० (शेकडा) हे प्रमाणभूत मानून दिलेली आहे.[२२]

वस्तू	१९२४-२५	१९२५-२६	१९२६-२७
कोळसा	५५.५६	८६.८	१०५.२
अशुध्द लोह	३१	५२	७१
तेल	७६	८९	११०
बीड	४०	६१	७६
पोलाद	४४	६८	८२
मीठ	६८	८१	१०२
सिमेंट	६४	११८	१३५
कापड	६७	९०	१०५
कागद	१५४	१८०	१८५
आगपेट्या	८६	१०७	१११
सिगारेट्स	१०२	१३३	१७०
केरोसिन	७१	८७	९५
तागाचे कापड	१३९	१९०	२१३
लोकरीचे कापड	७०	८४	९७

वरील आकडेवारीवरून सर्वच उद्योगधंद्यांमध्ये सातत्याने वाढ झाली असल्याचे दिसून येत आहे. अर्थात त्यास लेनिनचे नवे अर्थिक धोरण महत्त्वाचे ठरले आहे.

४.रशिया संदर्भातील इतर माहिती:

४.१. रशियाचे विश्वराष्ट्रीय गीत : रशियन बोल्शविक सत्ता प्रस्थपित झाल्यापासून विश्वराष्ट्रीय गीत मॉस्कोमधील क्रेमलीन टॉवरमधील घड्याळात रात्री बारा वाजता सुरू होते. ते मूळ रशियन भाषेतील आहे. हे गीत चित्रमय जगतमध्ये इंग्रजी व त्याचे मराठी भाषांतर करून दिलेले आहे.[२३] ते म्हणजे-

१ मरतमढ्यांनो उठा, डोळ्यावरील झापड काढून टाका; दरिद्र्यामुळे गुन्हेगार बनलेल्यांनो जागे व्हा, ती पहा बंडखोर बुद्धी थैमान करू लागली आणि अखेरीस ढोंगीपणाचे युगही समाप्त झाले. गुलामगिरीत खितपत पडलेल्यांनो, जुन्या धर्मभोळ्या समजुतींना लाथाडून द्या आणि उठा, जागे व्हा; आपण ताबडतोब जुनी परिस्थिती बदलून टाकू आणि स्वातंत्र्याच्या झेंड्याखाली उभे राहू, ह्या अखेरच्या युध्दाला तोंड देऊ या. हे विश्वराष्ट्रीयत्व साऱ्या मानवजातीला एकत्र करीत आहे. चला तर बंधूंनो.

२ हे राजे आपल्या सत्तेच्या जोरावर आमची धूळधाण उठवीत आहेत.आम्हाला जगात कोठेही युध्दे नकोत; सैनिकांना संप पुकारू द्या आणि शांततेकरिता प्रचंड गर्जना करा, आपली शस्त्रास्त्रे खाली ठेवा आणि बंधुत्त्वाच्या नात्याने हातात हात घाला. हे क्रूर राक्षस आपल्या विरोधाला न जुमानता जर आपला बळी देण्याची इच्छा करतील तर त्यांना आपण आपल्या बंदुकातून कसले जलाल विष सोडू शकतो हे या शेवटच्या युध्दात दाखवू या. चला माग बंधूंनो.

४.२. किरकोळ माहिती : किरकोळ माहितीमध्ये रशियातील सैन्याचे नाव हे 'रेड आर्मी' असे होते. तरूणांना लष्करी शिक्षण सक्तीचे होते. सोव्हिएट रशियाचे क्षेत्रफळ सुमारे २०९३९००० स्केअर किलोमीटर असे आहे. एवढ्या विस्तीर्ण प्रदेशात रशियन, युक्रेनियन, व्हाइट रशियन, तातार, पोलस, स्लाव्ह, किधीशियन, उझबेक, तुर्कोमन, फिन्स, ज्यू या प्रमुख जातीशिवाय अनेक जाती आहेत. बोल्शेविक सरकारच्या राजवटीचे चिन्ह म्हणजे एक हातोडा व विळा आहे. त्याच्या भोवती धान्याच्या कणसांची मेहरावळ, आजूबाजूला सहा भाषांत लिहिलेले 'जगातील सर्व कामकऱ्यांनी एक व्हावे' असे वाक्य असते. तसेच जरीपट्यावरही वरील चिन्ह रंगविले असून ते तांबड्या रंगातील असते.[२४]

४.३. छायाचित्र पुरवणी : रशियाचा खास अंक काढलेल्या *'चित्रमय जगत'* या मासिकामध्ये पुरवणी अंक जोडलेला आहे. त्यामध्ये रशियातील रशियन सैनिक, मजूर, मास्को येथे व्याख्यान देत असताना लेनिन, सोव्हिएट राज्याच्या दशवार्षिक उत्सवाचा देखावा, लेनिनचा पुतळा, घोड्याची पलटण, मास्कोमधील क्रेमलिन राजवाडा, रेड आर्मीचा सेनापती सीमियन मिखेलाविच वुडेनी, पेट्रोग्राडशहर, दहा हजार रूबल्सी नोट व त्यावर 'जगातील कामकऱ्यांनो, एकत्र व्हा' असे नऊ भाषेत लिहिलेली नोट, कामगार भाषण ऐकतांना, झारशाहीतील गरीब शेतकरी, बोल्शेविक लोक खेड्यातील लोकांना आपले तत्वज्ञान सांगताना, सोव्हिएट सरकारची निशाणे हातात घेतलेले तरूण, आरमार व

लष्कराचा अध्यक्ष व्होरोशिलॉफ, राष्ट्रीय बंदुकधारी सैन्य, वरिष्ठ मंडळाचा अध्यक्ष फेलिक्स झरहिनस्की, राजकिय खात्याचा मुख्य एम. मेनझिन्स्की, रशियाच्या स्वातंत्र्याकरिता तीन बालसैनिक, झारच्या काळातील तुरूंग क्रांतिकारकांनी फोडला व क्रेमलिन राजवाड्याच्या बाहेरच्या बाजूस लोक स्वातंत्र्याचा जयजय करताना लोकसमुदाय इत्यादी महत्त्वपूर्ण दुर्मिळ छायाचित्रे दिलेली आहेत. ह्या पुरवणीतील सर्वच छायाचित्रे ही *'चित्रमय जगत'* या अंकाचे वैशिष्ट्य आहे.

सारांश व निष्कर्ष :

विसाव्या शतकातील सामाजिक प्रबोधन व राष्ट्रवाद जागृती करणारे *'चित्रमय जगत'* हे एक प्रमुख मासिक आहे. विष्णूशास्त्री चिपळूणकरांनी पुणे येथे सुरू केलेल्या चित्रशाळा ह्या छापखान्यातून हे मासिक निघत होते. *'चित्रमय जगत'*ची निर्मिती वासुकाका जोशी ह्यांनी केली तर विस्तार व बौध्दिकता जपण्याचे कार्य संपादक त्र्यं. र. देवगिरीकरांनी केले आहे. स्वातंत्र्यपूर्व काळ व स्वातंत्र्योत्तरकाळातील देशविदेशातील राजकिय घटना, व्यक्ती, प्रदेश ह्यांना अनुसरून खास चित्रमय जगतचे अंक छापलेले आहेत. पुण्यातील चित्रशाळा छापखान्याव्दारे जून १९२८ मधील *'चित्रमय जगत'*हा अंक खास रशियन राज्यक्रांती व त्यानंतर दहा वर्षातील प्रगतीचा आलेख मांडणारा आहे. अंक प्रसिद्ध ब्रिटिश पोलिसांची चित्रशाळा छापखान्यावर छाप पडली होती. छापखान्यातील कपाटात रशियातून आलेली साम्यवादाची पत्रे व अंक होते. त्यातील एका पत्रात *'रक्तपाताशिवाय हिंदुस्थानात क्रांती होणार नाही.'* अशा संदर्भाचा उल्लेख होता. भारतीयांनी ब्रिटिश सत्तेच्या विरूद्ध क्रांतिशिवाय पर्याय नाही असे रशियातील साम्यवादी विचारवंतांना सूचीत करावयाचे होते. यावरून भारत आणि रशिया यांच्यातील राजकिय विचाराची देवाण घेवाण होत होती.

काही निष्कर्ष -

१. पहिले सचित्र मासिक म्हणून *'चित्रमय जगत'*चा उल्लेख केला जातो.
२. रशियाचा खास अंक प्रकाशित होण्यापूर्वी भारतात समाजवादी विचार सरणीचे बीज रूजत असल्याने *'चित्रमय जगत'* अंक प्रसिद्ध होताच चित्रशाळेवर पोलिसांची धाड पडली होती.
३. लेनिनचा जाहिरनामा हा भारतातील कामगारांना लढाऊ ठरलेला आहे.
४. राज्यक्रांतीमूळे नव सत्तेचा उदय झाला त्याप्रमाणे भारतामध्येही ब्रिटिशांच्या जुलमी सत्तेचा अस्त होऊन नविन सत्ता स्थापन होऊ शकते असा विचार लोकांमध्ये रूजला होता.
५. कायद्यापुढे सर्व समान असल्याची जाणीव अंकातील लेखनाने येथील लोकांमध्ये झाली.
६. राज्यक्रांतीने पारंपारिकते उच्चाटन तर केलेच पण त्याच बरोबर नंतर अवघ्या १० वर्षातच रशियाचा सर्वांगिन विकास घडवून आणला असल्याचे या खास अंकाव्दारे मांडले आहे.

७. अंकातील लेखन रशियातील कम्युनिस्ट विचारसरणीला अनुसरून असल्यानेच अंकाच्या मुखपृष्टावर लेनिन व कम्युनिष्टाचे चिन्ह व मलपृष्टावर लोक स्वातंत्र्याचा जय जय कार करत असल्याचे चित्र दिसून येत आहे.

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Versatile Remarkable Potent Bioactivity of Quinone based Compounds to Beat the Diseases.

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Abstract

Quinones are group of compounds which shows bioactivity against variety of microorganisms like virus, bacteria, fungi and effectively working with variety of strains of these groups. These compounds show effective tolerance to quire variety of infections in human being including cancer, flu, malarial infections and many more. The Covid 19 is a challenge in front of the world and prima facie quinine based compounds are used as a primary line drugs in treatment of coronal disease. It is need of the time to work or rework in synthesis of quinine based bioactive compounds for betterment of human life against micro-world organisms to save human beings. This review paper summarizes effectiveness and need of production of variety of quinine based compounds.

Key words: Quinone, Reactivity,Bioactivity, Covid 19

1. INTRODUCTION

Quinones are aromatic ketone category compounds having potential efficiency to react with variety of organic and inorganic molecules to develop new compounds.[1] It is observed that many active sites are present on quinones and co-compounds which work better to react and develop new molecule which may work effectively against diseases. Not only quinones but its derivatives and polymers are effective against variety of ranges of microbes to cure the diseases in human beings. Quinone base compounds shows thermal stability as it exhibits aromatic ring structure. These compounds shows reactivity through potential pai cloud and reasonable electrons. The presence of oxygen as a heteroatom in structure makes it more reactive to fight against disease causing microorganism. The ring structure is electron rich, therefore molecule can go with electrophilic substitution reaction where as ketonic carbonyl carbon is electron deficient. This dual characteristic makes quinone more active and potential drug to fight against disease condition. The tendency to go with tautomarization from quinone to hydroquinone form makes structure vary with properties and reactivity.[2] If quinone along with heteroatom like nitrogen, halogens, sulphur is used for development of medicinal compounds, it is observed that these category of compounds exhibit better bioactivity than normal molecules.[3]The heteroactomic groups on quinone imparts electron donating or electron withdrawing resonance and inductive effects which makes change in it's reactivity and thereby change in the pharmacokinetics and pharmacodynamics. According to Hammette equation concept these effects leads in change of activity of compounds by qualitatively as well as quantitatively. The change in activity is caused by change in sigma and rho values of additional groups present on compound along with their position and stereochemistry [4]. The polymers of quinone based molecules also shows effective antigermal activity and advantage of polymers is, they are required in low amount to fight against disease.[5] The invitro crossing barrier potential of quinone category compounds is up to the mark for various locations and organs in human body due to the pH condition of serum. We can adjust the pH of compound at required site by modification in it's structure with introduction of required functional group in base molecule by using concept of pharmacokinetics and dynamics.[6]
The pneumonia coci category viruses like Swine flu, Sars and Covid also treated with quinone based compounds. Therefore we must think to survey to develop variety of medically usable quinone based compounds. This paper has enlighten on use of quinone compounds in various diseases.[7]

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II. SYNTHESIS AND BIOACTIVITY

1. Quinoidal molecules and chagas disease:

   Quinoidal compounds are effective against disease chagas which is caused by blood sucking bugs of family 'Reduviidae'. This disease reduces immunity in mammals[8]. This can be treated along with use of napthaquinoidal compounds. Not only this illness but along with it quinoidol shows effective activity as a drug against leishmaniasis, [9]malaria and tuberculosis. Leishmaniasis is most neglected a parasitic disease caused by the Leishmania parasites and treated along with quinoidal category of compounds.

2. Stephania dinklagei and antiprotorazol activity:

   Stephania dinklagei is climbing shrub occurred in South African tropic which is widely distributed from Guinea East to Uganda and South to DR Congo, Tanzania and Cabinda. The fractional extraction of Stephania dinklagei includes alkonoied along with quinones. It shows better potential against variety of protozoal and cytotoxic microbes. The anthraquinines are present in extract and effectively works on diarrhea and cough.[10]

3. Quinone-Methide Triterpenoids as an ancient medicine:

   In ayurveda the sasalica group of plants are used as medicine. The 'Salacia petenensis' plant bark extract contain one of the major ingredient as quinone-methide triterpenoid. The terpenine category molecule shows wide range of bioactivity and along with quinone activity increases. Traditionally, in India it is used as effective antiseptic, anti-diabetic and antifungal drug to fight against these diseases. This quinone terpenoid directly works on chromosomal level. It interacts with DNA to cure the pathogenic condition. It affects like a cytotoxic on pathogen. Action is directly taken on chromosomal level and it is more on micro level for better effect as compaired to non-chromosomal level action of drug.[11]

4. Calothrixins and antiproliferative property:

   The antiproliferative property is main characteristic of anticancer drugs. This type of medicine works on inhibiting growth mechanism of tumour cells by disturbing their cellular metabolism to control the growth and spread across the infected region. The naturally occurring 'Calothrix Cynobateria' contains calothrixin which is quinone based natural product. The isolation of such quinone compounds from calothrix is used safely against the various types of cancer treatment. The category of quinones can cross effectively cell electrochemical barrier to reach across the target.[12]

5. Isoprenoid quinone, and dimeric anthraquinone as herbicide:

   These both the quinones are extracted from 'Tectona grandis' plant leaf. This plant contains rich amount of both the quinones. These show high level of bioactivities against various category of plant infections. It is included for the treatment of weeds during plantation of rice, chilli, cotton, tomato, ginger etc.[13]

6. Noval quinolines and antimalerial activity:

   The malaria and dengue are common insect bite prone diseases. In many cases infection goes at severe level and may become life threatening as well. The variety of groups of drugs are available for the treatment but among all of them quinone category medicines are more effective to cure the disease. The noval series of quinones are quinine derivatives made by introduction of chloride, hydroxide, nitrogen, sulphur containing groups on quinine structure to enhance the activity to fight against disease. These types of modifications are carried out by using medicinal chemistry tools like molecular hybridization. The mefloquin, amodiaquin, chloroquine are used commonly worldwide in practise for treatment of malarial infections.[14]

7. Mitochondrial diseases and derivatives of quinone:

   At cellular level invitro mitochondria works as energy packet. It helps to develop energy in body by burning food. The dysfuctioning of mitochondria many lead serious effect like poor growth, metal and physical weakness. This inappropriate functioning of mitochondria is caused by mutations in it at cellular level which may leads to secondary diseases like alzheimer, muscular dystrophy, diabetes, cancer etc. It is observed that quinone compounds and it's derivatives works effectively against mitochondrial dysfunctioning as quinones have very good potential to cross mitochondrial barrier and it can directly get into the cell to bind with DNA. These molecules are safe to use as after mechanisms no residue of these compounds left with infected area as well as in the body. They have polar potential to hit the target cell. The 2,3,5-trimethyl-6-geranyl-1,4-benzaquinone and 2,3-dimethyl-6-decyl-1,4-benzoquinone are more commonly used for the treatment.[15]

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8. Hydroquinone and Covid 19:

In current pandemic situation, world is facing battle against corona virus - Covid 19. All over the world every single individual living being is suffering with severe impact of this social spreader virus. The adverse effects are observed on health, society, economy, politics as well as on security of all nations. This tiny virus has brought us to knee down. The main reason behind it is unavailability of preventive vaccination and safe, proper therapeutic medicines to recover the disease. It is difficult task to handle spread of this virus because of its lifecycle and survival mechanism. Covid 19 belongs to noval corona virus family and advance version of Pneumonia cocoi, Swine Flue, Sars. It is a self mutant virus with changeable m-RNA of its DNA. By looking towards metabolism of virus, quinine drugs are more effective to work on it as quinone molecules have remarkable potential to bind with nucleotide of DNA to inhibit the growth mechanism by hampering genome sequence of the virus. The chloroquine and hydroquines are used for the Covid 19 treatment. But for the disease, use of these molecules have shown parallel side effects like hematologic and liver toxicity.[7]

III. Conclusions

Naturally occurring, experimental isolated, extracted and laboratory synthesised quinone molecules and their compounds are medicinally valuable and effect to fight against many diseases. In Ayurveda, Homeopathy, Allopathy and in many tribal traditional medicine practises. We are taking advantage of the quinone molecules and corresponding derivatives.

IV. Future scope:

Today entire world is trying to defeat corona virus for betterment of valuable human life and hence it is important now to discover most suitable and proper line of treatment, effective medicines and vaccine against the ‘Covid 19’. Although we are using chloroquine and hydroxyquinone for the treatment we need to develop more effective combichem compound by using quinones with available database molecular modelling, pharmacokinetics and pharmacodynamics for betterment of the society.

Acknowledgment

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S.T.U.S. Mandal's

Sangola College, Sangola

Kadalas Road, Dist. Solapur (MS) India - 413307

International Conference

On

"Recent Advances in Physical and Chemical Sciences"

22nd January 2020.

e-Proceeding

ISBN 978-93-5396-893-9

ICRAPCS 2020

Organized by

IQAC, Department of Physics and Chemistry

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Convener
Dr. Tanaji Mane, Head, Dept. of Physics
Mr.Prakash Patil, Head, Dept. of Chemistry

Organizing Secretory,
Mr. Raghunath Shinde, Dept. of Chemistry

ISBN - 978-93-5396-893-9

Our Inspiration

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Guruvarya Bapusaheb Zapake

Bajarang (Abaso) Lokhande

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S.T.U.S. Mandal's

Sangola College, Sangola

International Conference

22nd January 2020

On

"Recent Advances in Physical and Chemical Sciences"

Proceeding

(ICRAPCS-2020)

Message

Hon'ble Baburaoji Gaikwad

President, S. T. U. S. Mandal, Sangola

ICRAPCS 2020

Dear Researchers, Faculties and Students,

I offer a very warm welcome to all the delegates from across India and abroad participating in the International Conference on **'"Recent Advances in Physical and Chemical Sciences"** organized by Department of Physics and Chemistry of this college on 22nd January 2020.

Sangola College, Sangola is one of the renowned college in the rural Maharashtra. It is now being recognized as a distinguished Centre of academic activities including research, academic innovations and other academic events such as organization of Local , State and National Conferences, Seminars and Workshops.

We all are aware that the developments in the fields physical and Chemical Sciences going to cause revolutionary changes in all the fields of day to day life. I am happy that Sangola College, Sangola is giving very energetic response to this developing area of research and knowledge.

I am highly impressed by the fact that, our college is organizing an International Level Conference. I would like to congratulate **Dr. M.T.Bachute**, Principal of this college and his colleagues for taking initiative in organizing this International conference on the important theme. I am sure that this conference would provide an appropriate academic platform for knowledge sharing among the experts from different parts of our nation as well as abroad.

I again offer a very warm and cordial welcome to all the participants and wish the conference a great

ICRAPCS 2020

Message

Hon'ble Mr. M. S. Zirape

Secretary , S. T. U. S. Mandal, Sangola

Dear Researchers, Faculties and Students,

It gives me an immense pleasure to know that the Department of Physics and Chemistry of Sangola College, Sangola are organizing an International conference on "Recent Advances in Physical and Chemical Sciences" on 22nd January 2020.

Sangola College, Sangola is one of the esteemed colleges of P. A. H. Solapur University, Solapur functioning for more than four decades. It is one of the biggest colleges in the Solapur District and strives to achieve excellence in higher education for betterment of stake holders.

I am sure that the conference will be very much fruitful and participants will richly benefit from it. I extend my best wishes and grand success for this International event.

Message

Dr. M. T. Bachute

Principal, Sangola College, Sangola

Dear Distinguished Researchers, Faculties and Students, to achieve the high expectations of research and educational standards in higher intellectual capability, innovative minds are required. The International level conference on, **"Recent Advances in Physical and Chemical Sciences"** is an endeavor of Physics and Chemistry Departments of this college to bring together and provide a platform to the experts across the nation and abroad to interact, deliberate, disseminate, exchange ideas, share knowledge and develop a common vision for the future developments.

An event of this magnitude will provide ample opportunity for our students to learn about new invention in these fields. It also provides a platform for researchers across globe for stimulating deliberations which may culminate into collaborative research atmosphere mutually beneficial to all. These developments in turn, will boost not only economic strength but also materialistic prosperity of the society.

As a Principal of this college, I cordially welcome you to this conference for experiencing and sharing knowledge on Advances in physical and chemical sciences

I am sure you will enjoy pleasant weather and technical sessions of this conference. I wish good luck to all participants and delegates.

ICRAPCS 2020

Message

Dr. Pradip Sarawade

Department of Physics, Mumbai, University

Dear Researchers, Faculties and Students,

It's my great pleasure to meet the department of Physics and Department of Chemistry of Sangola College, Sangola on occasion of one day International conference on "Recent Advances in Physical and Chemical Sciences" on 22nd January 2020. The physical and chemical science has a great future in the 21st century and has a potential to change the life style of the people.

I am sure that the conference will be very fruitful and the participants will richly benefit from it. The deliberations on the subject which will helpful for the Youngers, researchers, teachers and industrialists.

I convey my best wishes and greeting to all the delegates and organizer and wish the great success.

Message

Dr. Shaibal Banerjee
Head, Dept. of Applied Chemistry

Telephone No. : (020) 24304261
Fax No. : (020) 24389411
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Website : www.diat.ac.in

Defence Institute of Advanced Technology
(Deemed-to-be-University),
Girinagar, Pune -411025.
(An Autonomous Organization fully funded by Dept of Defence R & D, Ministry of Defence)

Message

It is an honor to be a part of the one day International conference on **Recent Advances in Physical and Chemical Sciences" (ICRAPCS-2020)** at Sangola College, Sangola. The conference is unique of its kind in our country and will witness confluence various areas of physical and chemical sciences. The conference will also focus on the recent advancements in the field of physical and chemical sciences thereby immensely benefitting young minds. The modern day science is increasingly breaking traditional barriers and multidisciplinary approach is required to solve new problems.

I compliment the organizing committee for inviting eminent personalities who have been working selflessly for decades in this field. I wish the conference a grand success.

Shaibal Banerjee
Dr. Shaibal Banerjee

Place : Pune

Date : 17/01/2020

ICRAPCS 2020

ICRAPCS 2020

Message

राष्ट्रीय रासायनिक प्रयोगशाला
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CSIR-National Chemical Laboratory
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Phone: +91 20 2590 2306
Fax:-+91 20 2590 2615

Message for the International Conference on "Recent Advances in Physical and Chemical Sciences" from Dr. Prakash P. Wadgaonkar, CSIR- National Chemical Laboratory, Pune.

I am delighted to note that Sangola College, Sangola is organizing an International Conference on "Recent Advances in Physical and Chemical Sciences". I would like to congratulate the Organizers for this effort.

Science and Technology has revolutionized human life and thinking in several ways. Developments in science and technology have played and will continue to play a pivotal role in providing products and materials needed for improving the quality of human life.

Global challenges related to energy, food and climate change could only be addressed with the advances in chemical, physical and allied sciences and, thus, secure a sustainable and wholesome environment for all the earth. The researchers with background in chemical, physical, biological and social sciences need to work together to come up with the solutions for pressing needs of the present and future.

It is fitting that the Organizers have selected a very pertinent and contemporary theme for the conference.

I am certain that the deliberations in the conference would enthuse and energize the participants to undertake research and developmental work on the interdisciplinary topics of societal relevance.

I wish the conference a grand success

PPWadgaonkar

Prakash P. Wadgaonkar

Message

Dr. T. R. Mane

Convener and Head, Dept. of Physics

It gives me an immense pleasure to welcome all the resource persons, delegates from academia and industries, research scholars, post graduate students on this auspicious occasion of International conference on 'Advances in Physical and Chemical Sciences' organized by Department of Physics and Department of Chemistry, Sangola College, Sangola.

The theme of the conference covers the advancements developed in the Physical and Chemical sciences. The objective of the conference is to bring together the academicians, scientists, and industrialist's research scholars, post graduate students on common platform to share the knowledge, experience and expertise.

On behalf of the organizing committee, I would like to thank Principal Dr. M. T. Bachute and all my colleagues for their immense support and for agreeing to host this seminar jointly with Physics and Chemistry Department, Sangola College, Sangola. We welcome you all of you to enjoy the scientific deliberations and the ambience of the Sangola.

Once again we extend our warm welcome to all the delegates. Your valuable suggestions and rational feedback will help us a lot to improve and empower ourselves.

ICRAPCS 2020

Message

Mr. P. S. Patil

Convener and Head, Dept. of Chemistry

It gives me an immense pleasure to welcome all the resource persons, delegates from academia and industries, research scholars, post graduate students on this auspicious occasion of International conference on 'Advances in Physical and Chemical Sciences' organized by Department of Physics and Department of Chemistry, Sangola College, Sangola.

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Message

Mr. R. A. Shinde

Organizing Secretary,

ICRAPCS 2020

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Once again we extend our warm welcome to all the delegates. Your valuable suggestions and rational feedback will help us a lot to improve and empower ourselves.

ICRAPCS 2020

Message

Dr. Sanjay Latte

Assist. Prof. Department of Physics,
R. R. College, Jath

I am delighted to note that Sangola College, Sangola is organizing an International Conference on " Recent Advances in Physical and Chemical Sciences" organized on 22nd January 2020. As an alumni of this college, I hope that this conference will provide a good platform for young researchers to meet eminent scientists and exchange their ideas about research in an important fields in the physical and chemical sciences.

I wish my best wishes for the success of the conference.

From the Desk of Editor

Dr. Vidhin S. Kamble

Dr. Prakash A. Bansode

The advancements in Physical and Chemical Sciences include dynamic, exciting and remarkable discoveries and developments. This involves development of smart functional materials such as high performance polymers, drug delivery systems, materials for artificial tissue engineering and theragnostics etc. These advancements are expected to bring new fascinating outcomes in diverse areas of cancer, diabetes treatments, energy segment and regenerative medicine, health care. The sustainable development could be achieved by green chemistry practices that aim at preservation of natural resources, cost effectiveness and will raise the quality of human life. Innovations and developments will have no significance without sustainability.

ICRAPCS-2020 aims to bring physicists, chemists, material scientists, technocrafts, pharamacists, scientists, academicians and young budding researchers to have exchange of ideas, scientific discussions about recent advancements in various domains of science and technology. This conference will provide an opportunity to enlarge your network and bring the exchange and creation of knowledge establishing further future collaborations. I highly appreciate all the authors for their valuable contribution of abstracts and full length papers. The proceeding includes papers from diverse fields such as medicinal chemistry, material science, phytochemistry, computational chemistry, energy devices, mycology, catalysis, green chemistry methods etc. Its our immense pleasure to thank Hon. Prin. Dr. Madhusudan Bachute, Dr. T. R .Mane, Prof. P.S. Patil, Prof. R. A. Shinde, Prof. S. V. Patil and editorial committee for their help and support in publication of proceeding of International Conference of Recent Advances in Physical and Chemical Sciences (ICRAPCS-2020) held at Sangola College Sangola on 22nd January 2020. This proceeding would provide a platform for researchers, students and faculties to share views and concepts and expected to help them in blossoming their future research endeavours.

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Sangola College, Sangola

International Conference On

RECENT ADVANCES IN PHYSICAL AND CHEMICAL SCIENCES

Organized By

IQAC, Department of Physics and Chemistry,

PROGARMME

Date- 22nd January 2020

Sr. No.	Time	Programme
01	8.30 a.m. To 10.00 a.m.	Spot Registration & Poster display
02	10.00 a.m. To 11.00 a.m.	Inaugural function Inaugurator: Hon Dr. (Smt.) M. M. Fadnavis (V.C.PAHSU, Solapur) President: Hon. Shri. Baburaoji Gaikwad (President, S.T.U.S. Mandal, Sangola) Chief guest: Prof. Levent Demirel (Koc University, Istambul, Turkey) Dr.Annamario Moko (Koc University, Istambul, Turkey) In presence: Hon. Mr. T.N. Kedar (Vice-President, S.T.U.S. Mandal , Sangola)) Hon. Prof . P. C. Zapake (Vice-President, S.T.U.S. Mandal , Sangola)) Hon. Shri. M. S. Zirape (Secretary, S.T.U.S. Mandal , Sangola) Prof. V. P. Ubale (Dean, Faculty of science and Technology, P.A.H. Solapur University, Solapur) Dr. M. T. Bachute: Principal, Sangola College, Sangola Prof. B. R. Karche B.O.S.Chairman in Physics, P.A.H. Solapur University, Solapur Dr. S.K.Chavan B.O.S.Chairman in Chemistry P.A.H. Solapur University, Solapur

Sr. No.	Time	Programme
03	11.00 p.m. To 12.00 p.m.	**Invited talk –I** Prof. Levent Demirel (Koc University, Istambul, Turkey)
04	12.00 p.m. To 1.00 p.m.	**Invited talk-II** **Dr. Pradip Sarwade** Mumbai University
05	1.00 To 2.00 p. m	Lunch Break
06	2.00 p.m. To 3.00 p.m.	**Invited talk-III** **Dr. P.P.Wadgaonkar** Eminent scientist, N.C.L.Pune
07	3.00 p.m To 4.00p.m	Poster presentation session
08	4.00 p.m. To 4.30 p.m.	Tea break
09	4.30 p.m.	**Valedictory function** Chief guest:- III **Dr. P. P. Wadgaonkar** Eminent scientist, N. C. L. Pune

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Welcome..!!!

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Abstract and Research Papers

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"Recent Advances in Physical and Chemical Sciences"

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Editorial Board

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Synthesis of pyridin-4-yl triphenyl pyrazol-4-yl-thio-1,3,4-oxadiazole derivatives mediated by Bleaching Earth Clay (pH 12.5) as antibacterial and antioxidant agent

Ajay N Ambhore[1], Shuddhodan N Kadam[2], Bhaskar S Dawane[3*]

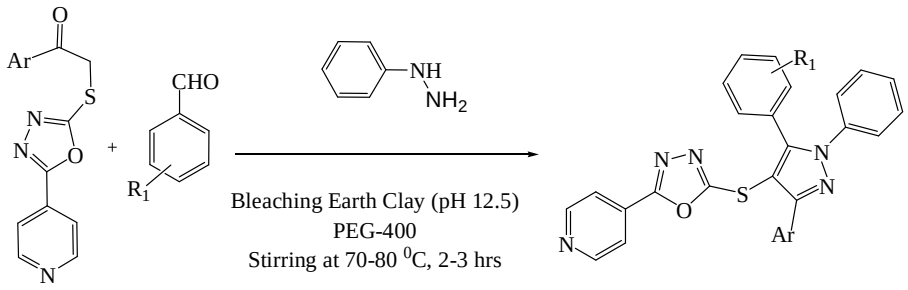
Padmabhushan Dr Vasantraodada Patil Mahavidyalaya, Tasgaon Dist Sangli

Vidnyan Mahavidyalaya, Sangola Dist. Solapur

School of Chemical Sciences, SRTMU, Nanded

Abstract

Synthesis of heterocyclic compounds by molecular hybridization has provoke interest because of its extensive range of pharmacological properties. By keeping this prospective in mind numerous heterocycles are synthesized by various methods. Here, we report the synthesis of pyridin-4-yl triphenyl pyrazol-4-yl-thio-1,3,4-oxadiazole (7**a-p**) by using Bleaching Earth Clay (pH 12.5) and PEG-400 as a green reaction media. All these synthesized compounds were characterized by spectral data and screened for their antibacterial and antioxidant activity. Most of the synthesized compounds display remarkable activity.



Keywords: pyrazole 1,3,4 oxadiazole, PEG-400, BEC, Antibacterial, Antioxidant activity.

FERROCENE CONJUGATES FOR ANTICANCER THERAPEUTICS

Prakash Bansode[a], Altafhusen Naikwade[b], Rajanikant Kurane[c], Megha Jagadale[d], Pradnya Patil[e], Shivanand Gajare[e], Gajanan Rashinkar[e*]

[a]Department of Chemistry, Sangola College Sangola, 413307, M.S., India

[b]Department of Chemistry, Shivraj College, Gadhingaj, 416551, M.S., India

[c]Department of Sciences and Humanities, Rajarambapu Institute of Technology, Islampur, 415415, M.S., India

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Abstract

Two novel series of structurally diverse ferrocene functionalized pyrimidobenzothiazoles (**6a-j**) and pyrimidobenzimidazoles (**7a-e**) were rationally designed, synthesizedand evaluated for their *in vitro* anticancer activity against human breast cancer cell lines. Among thesynthesized series, compounds **6a**,**6c**, **6g**, **6h**and **7e** displayed significantly higher anticancer activity against breast carcinoma MCF-7 and MDA-MB-231 cell lines (GI_{50} 0.018-0.022 µM) as compared to the standard drug doxorubicin (GI_{50} 0.018µM).Furthermore most of the synthesized compounds (**6a-f**, **6i-j** and **7a-d)** were found to exhibit significant antioxidant activity in DPPH, SOD and FRAP assays compared to standard ascorbic acid and trolox. Moreover, compounds **6g**, **6h** and **7e** were found to be potent anti-angiogenic agents with angiogenic score ranging 0.8-1.4. The molecular docking analysis ascertained the mode of action of target compounds *via* inhibition of heat shock protein90 (Hsp90).

Keywords: Cancer, angiogenesis, pyrimidobenzothiazole, pyrimidobenzimidazole, heat shock protein (Hsp90).

POTENTIAL OF MACHINE LEARNING IN COMPUTATIONAL CHEMISTRY

Prakash Bansode[a], Trupti Bansode[b]*

[a]Department of Chemistry, Sangola College, Sangola, M. S., India

[b]Department of Computer Science and Engineering, Fabtech Technical Campus, College of Engineering and Research, Sangola, M.S., India

*Email: satpute.trupti@gmail.com

Abstract:

Machine learning has undergone drastic improvements in many applications such as speech recognition, computer vision. These powerful techniques are getting used in computational chemistry for various tasks like prediction of reactivity, physical or chemical properties etc. The present work focus on the algorithms in machine learning and deep learning used in chemistry for various tasks like molecular structure prediction, QSAR, plausible reaction mechanism prediction etc. Further it explains about the benchmarks used in molecular machine learning.

Keywords: Machine Learning, Computational Chemistry, Cheminformatics

AN ECO-FRIENDLY GREEN ROUTE FOR SYNTHESIS OF FE_3O_4 MANGNETIC NANOPARTICLES AND THEIR APPLICATION IN CANCER HYPERTHERMIA

Pandurang Kumbhar, Abhijit Ingole, Vishal Doke, Lakhan Bedre, Sagar Kakade
Madhusudan Bachute, Prakash Patil, Raghunath Shinde, Bharat Pawar,
Renukacharya Khanapure, Prakash Bansode*
Department of Chemistry, Sangola College Sangola, Dist.-Solapur-413307 (M.S.) India
Email: bansode.prakash4@gmail.com

Abstract: In the present investigation, a simple, rapid, and eco-friendly green method was successfully introduced to synthesize magnetite nanoparticles (Fe_3O_4 NPs). *Bryophyllum pinnatum* aqueous leaf extract was employed as a green solvent, reducing and capping agents. The synthesized Fe_3O_4 NPs were characterized with X-ray diffraction (XRD), Fourier Transform Infrared (FT-IR), and Transmission Electron Microscopy (TEM) techniques. The X-ray diffraction planes at (220), (311), (400), (422), (511), (440), and (533) were corresponding to the standard Fe_3O_4 patterns, which showed the high purity and crystallinity of Fe_3O_4 NPs had been synthesized. Based on FT-IR analysis, two characteristic absorption peaks were observed at 556 and 423 cm^{-1}, which proved the existence of Fe_3O_4 in the prepared nanoparticles. TEM image displayed the synthesized Fe_3O_4 NPs were mostly in spherical shape with an average size of 10-20 nm.The synthesized nanoparticles produced good therapeutic temperature in cancer hyperthermia experiment.

Keywords: Green synthesis, Fe_3O_4 nanoparticles, Bryophyllum pinnatum, Transmission electron microscopy, Hyperthermia

COMPARATIVE ANTIOXIDANT ACTIVITIES AND TOTAL FLAVONOID CONTENT OF COMMONLY CONSUMED TEAS

Jitendra Chavan, Swapnil Patil, Suraj Salunkhe, Pravin Kadam, Samadhan Kashid, Madhusudan Bachute, Prakash Patil, Raghunath Shinde, Bharat Pawar, Renukacharya Khanapure, Prakash Bansode*

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Abstract: Tea is the most common, popular, non-alcoholic and widely consumed beverage next to the water across the world due to its taste, aroma and lately reported neutraceutical values. Tea currently is the hot topic in both nutritional and therapeutic research worldwide because the presence of crucial therapeutic compounds in tea especially flavonoids which are more bio-stable and direct acting than those found in other plants. The flavonoids present in the tea leaves are known to exhibit anticarcinogenic,antimicrobial, antiviral, antiarteriosclerosis, antihypertensive, antidiabetic, anti-inflammatory and antidiuretic activities and thus they are therapeutically important class of compounds. Therefore it is necessary to find out actual levels of bioactive compounds in various tea samples. In the present investigation ten commercial varieties of black and green tea from Indian market were analyzed for their total flavonoid content using uv-visible spectrophotometer. The total amounts of flavonoid were determined by aluminium chloride method using quercetin as standard compound and the total flavonoids were expressed as mg/g of quercetinequivalents. The results shown that all tea samples tested found to contain comparable high total flavonoids as rich sources of bioactive compounds and it justifies their use for human health benefits. The prepared aqueous tea extracts were evaluated for their in vitro antioxidant activity using DPPH and NO assays which displayed significant activity compared to standard ascorbic acid.

Keywords: Flavonoids, Cancer, Aluminium chloride, Quercetin, Human health

Electrical conductivity studies of polyaniline doped with 2-furoic acid

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Abstract –

Doped polypyrrole samples were synthesized by in situ chemical oxidative polymerization technique with Ammonium persulfate as an oxidant and by using 2-furoic acid as dopent. Electrical conductivity of chemically synthesized polypyrrole has been studied at room temperature and normal pressure. The PANI synthesized was characterized by measurements of conductivity, FTIR, UV–VIS, XRD, SEM.

Key words: Doped polypyrrole, Conductivity, XRD, SEM.

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Effect of annealing temperature on the supercapacitive performance of MnO_2 electrodes prepared by chemical bath deposition

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Abstract:

Annealing temperature is a crucial factor in determining the structural as well as the electrochemical performance of the suepercapacitive electrode. In present case, MnO_2 has been deposited on the flexible stainless steel strips and the supercapacitive electrodes are prepared using the chemical bath deposition technique. 100ml aqueous solutions 1 M each of $Mn(NO_3)_2.6H_2O$ and NaOH were separately prepared and mixed. Reaction time was kept 30 min and the stir rate of solution was kept 200 rpm. Stainless steel flexible electrodes were used as conducting substrates. The prepared electrodes were annealed at different temperatures viz. 423K, 473K, 523K and 573K were named as T_1, T_2, T_3 and T_4 respectively. The prepared electrodes were analyzed with different techniques such as XRD, SEM, EDX and cyclic voltammetry. It was found that the prepared electrodes demonstrate the gradual change in the grain size. The average crystallite size increases with the annealing temperature from T_1 with average crystallite size 21.5 nm to 30.5 nm. The surface morphology of the prepared electrodes change from nano discs to nanoflakes with increase in annealing temperature from T_1 to T_4. The specific capacitance was found to be increased from T_1 to T_4. The observed maximum specific capacitance was 764 F/g for T_4 electrode with nanoflakes of average size 300 nm.

1 INTRODUCTION

Pseudocapacitors also known as the redox capacitors store the charge by fast faradaic reactions at the electrode-electrolyte interface. These are generally used for quick discharge and high power applications [1-4]. Various transition-metal oxides/hydroxides such as RuO_2[5,6], Fe_3O_4[7], FeOOH[8], Fe_2O_3[3], V_2O_5, $CuOH_2$[9], NiO[10] etc., are being studied as materials for the supercapacitor applications. RuO_2 is the most preferable material for supercapacitors because of its high specific capacitance, excellent reversibility, and long cycle life[]. High cost, less abundance and toxic nature have limited the commercial use of RuO_2[5,6]. Accordingly,

there is a strong enticement to find alternative electrode materials, which are inexpensive and exhibit pseudocapacitance similar to that of hydrous amorphous RuO_2. Mn oxides, has ease of production, extremely affordable sources, large abundance of precursors hence it can be the good alternative for expensive electrode materials like RuO_2 electrode material used in supercapacitors. Chemical bath deposition (CBD) is a chemical technique of thin film deposition in which the thin films are growh on the substrate with the help of chemical reactions between the source solutions. The technique provides various advantages such as consistant stoicheometry throughout, scalable size and shape of the films, control over the growth and surface morphology of the grown films by varying the synthesis parameters. There are various synthesis parameters such as precursors, molar concentration of the precursors, volume, annleaing teperautre, reaction time etc.

The Annealing temperature can be dominant factor as per the capacitive performance of the material is concerned. Annealing temperature effect on TMOs thin films were checked by many researchers for different purposes likewise photocatalytic performance [11], supercapacitive performance [12] etc. Some researchers found that crystallinity of samples and also grain size increases with increase in annealing temperature for cobalt oxide thin films [13-16]. Zheng *et al* found that in case of RuO_2, crystallinity of films increases with increase in annealing temperature and SC drops rapidly with increases in annealing temperature [17]. Change in porosity, contact angle and SC of ruthenium oxide electrode due to annealing temperature was examined earlier.

Similar changes in the manganese oxide structure are expected. It could be interesting to see the effect of annealing temperature on the the structural, morphological and hence the electrochemical performance of the prepared electrodes.

2 EXPERIMENTAL

The chemicals used for synthesis were of analytical grade and purchased from SDFC India. Stainless steel strips were used as substrate maerials. 100 ml of aqueous solutions of 1 M each of $Mn(NO_3)_2.6\ H_2O$ and NaOH were used as reaction solutions. Reaction time was kept 30 min and the stir rate of solution was kept 200 rpm.

Electrodes were annealed at different temperatures viz. 423K, 473K, 523K and 573K were named as T_1, T_2, T_3 and T_4 respectively.

3 RESULTS AND DISCUSSION

3.1 Reaction for the film formation

$$Mn(NO_3)_2 + NaOH \longrightarrow Mn(OH)_2 + NaNO_3$$

$$2\ Mn(OH)_2 + O_2 \longrightarrow 2\ MnO_2 + 2\ H_2O$$

$$3\ MnO_2 + O_2 \longrightarrow Mn_3O_4 + 2\ O_2 \uparrow$$

cheme 1

The reaction menchanism is as shown in scheme 1 for the formation of Mn_3O_4. Initially there is a double displacement reaction leading to the formation of $Mn(OH)_2$. This is converted to MnO_2. This is on annealing produces Mn_3O_4.

3.2 Structural analyses

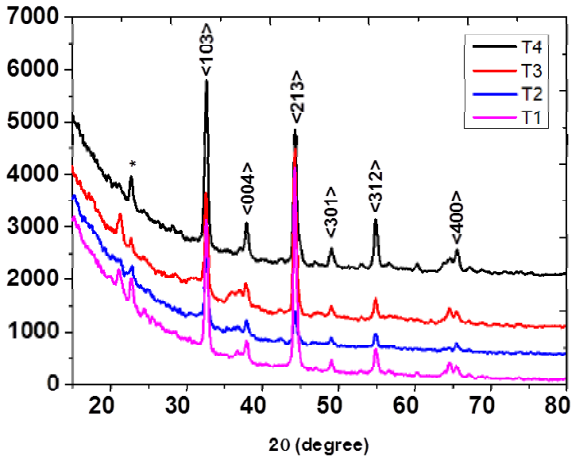

Figure 1. XRD spectra of T_1, T_2, T_3 and T_4

Figure 1 shows XRD patterns of manganese oxide prepared at different decomposition temperatures. All electrodes revel polycrystalline nature. The observed 'd' values were matches properly with the standard 'd' values taken from JCPDS data card (80-0382) of Mn_3O_4. All electrodes shows good orientations along (103), (213) plane having tetragonal body centered crystal structure. Using Scherer's formula crystallite size 'D'were calculated. From the XRD pattern, material deposited at different temperatures showed slightly changes in peak positionsand orientations of planes. Sample T_1 showed orientationsalong (103), (004), (213), (301), (312)

and (400) having crystallitesize ~ 32.21 nm for (103) plane,33.30 nm for T_2, 30.4 nm for$T_3$and 28.10 nmfor T_4.

Electrodes T_1, T_2, T_3 and T_4 show face centered cubic crystal structure. Sample T_1 showed average crystallite size for (103) plane ~ 21.80 nm, whereas T_2 average crystallite size for (103) plane is ~ 23.5 nm and sample T_3 ~ 32.60 nm, whereas T_4 ~ 30.5 nm

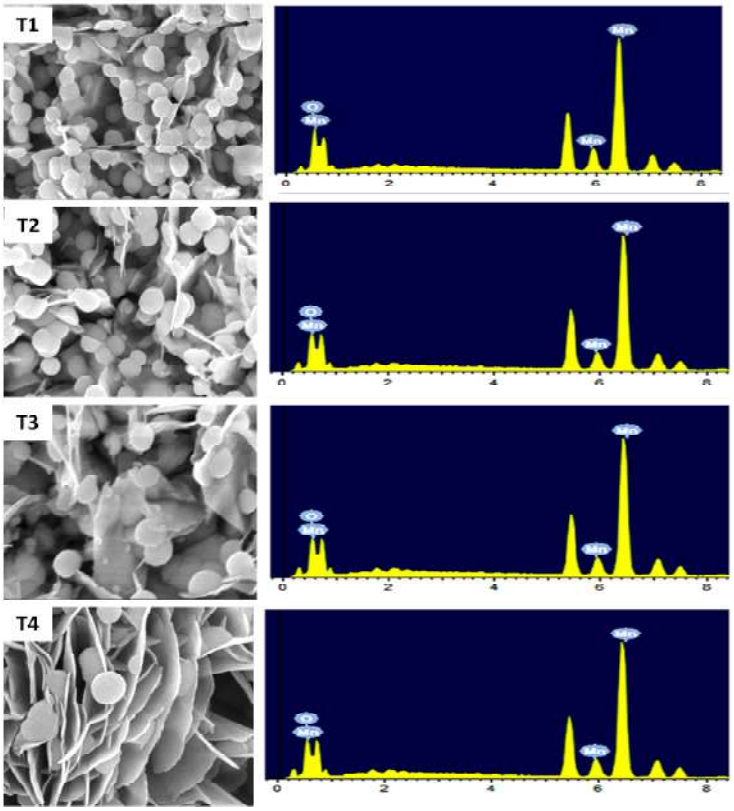

Figure 2 : FE-SEM images and EDX spectra T1, T2, T3 and T4

The SEM analyses of T_1, T_2, T_3 and T_4 were carried out (figure 2) SEM images exhibit transition in surface morphology with annealing temperature.T_1 shows the small nanodiscs and nanoflakes. The surface morphology transforms such that the nanodiscs are transformed from nanodiscs to nanoflakes. This may be due to the increase in average crystallite size. T_4 exhibit huge amount of nanoflakes of average size 300 nm and the nanodiscs of average size 30 nm. This morphology is extremely supporting the huge amount of charge storage. The EDX spectra show peaks for Mn and O this confirms the formation of Mn_3O_4 (figure 2).

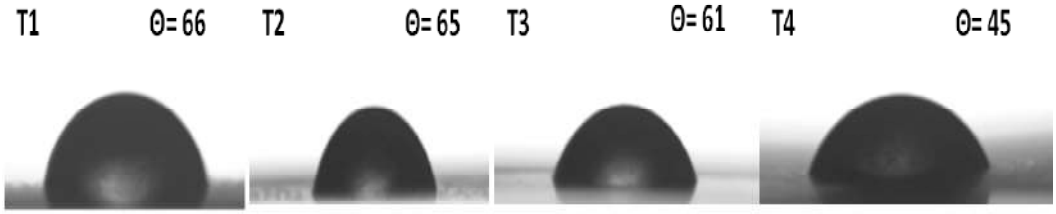

Figure 3 wettability study of T_1, T_2, T_3 and T_4

The surface wettability study of T_1, T_2, T_3 and T_4 indicates that the contact angle goes on decreasing with annealing temperature (figure 3). Thus the electrodes become more hydrophilic as the annealing temperature goes on increasing. This may increase the SC of electrodes. The lowes contact angle observed was 45° for the electrode T_4 prepared at annealing temperature 573 K.

3.2 Electrochemical characterization

3.2.1 Cyclic voltammetery

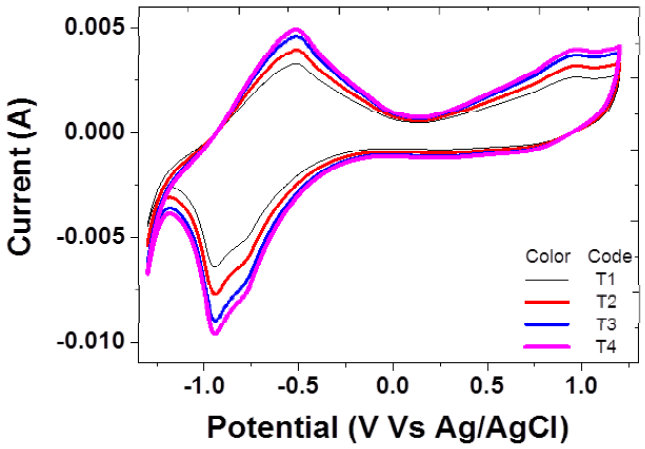

Figure 4. CV curves of T_1, T_2, T_3 and T_4

The CV analysis of electrodes T_1, T_2, T_3 and T_4 has been carried out in 20 ml of 1 M NaOH and 100 mV/s at the SC values were calculated. The as calculated values of SC are mentioned in table 1.

Table 1. SC values of T_1, T_2, T_3 and T_4 at 100 mV/s

Electrodes	SC at 100 mV/s
T_1	288
T_2	345.62
T_3	401.2
T_4	432

As the electrode T_4 shows the maximum SC of 432 F/g, it was analysed at different scan rates.

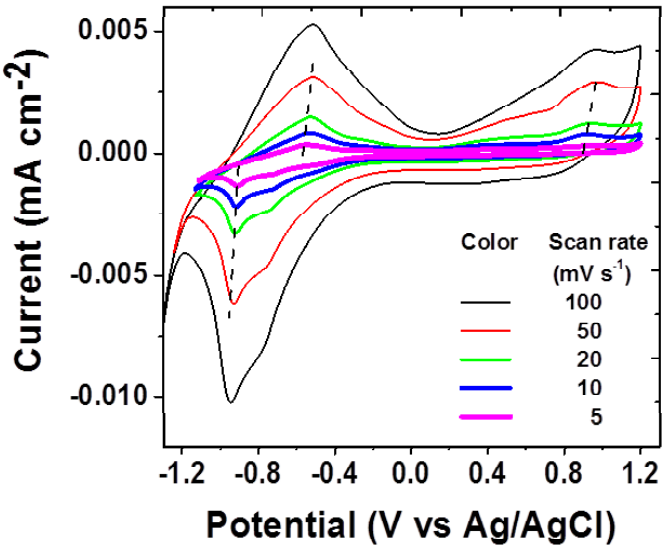

Figure 5 .CV curves of T_4 at different scan rates

The CV analysis at different scan rates from 5 mV/s to 100 mV/s has bee carried out as shown in figure 5. The specific capacitance goes on increasing with decreasing scan rates. The SC values are given in table 2

Table 2 SC values of T_4 at different scan rates

Electrodes	SC at 100 mV/s
5	764.8
10	700
20	590
50	547.2
100	460.8

Thus it is observed that the maximum SC of 464.8 F/g at 5 mV/s.

3.2.2 EIS study

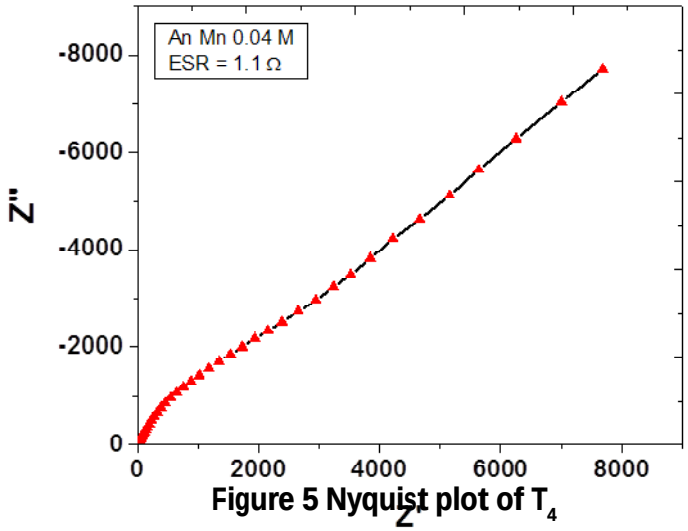

Figure 5 Nyquist plot of T_4

The EIS study of T_4 at variable frequency in the range 10 mHz to 1 MHz is carried out (Figure 5). The ESR is 1.1 &! which is extreamly desirable. The warburg impedance (R_w) is nearly 1&!. This indicates that the diffusion of electrolyte ions is easier and hence SC is very high.

4. CONCLUSIONS

Thus the annealing temperature greatly affects the growth, morphology and hence electrochemical performance of the MnO_2 electrodes. The specific capacitance of electrodes goes on increasing with the annealing temperature. The observed maximum specific capacitance was 764.5 F/g at 5 mV/s.

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MANGANESE OXIDE THIN FILM BASED ELECTRODE FOR SUPERCAPACITIVE STUDY

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Abstract: Manganese oxide based thin films were prepared by low cost and simple electrodeposition method. The electrodeposition was carried out by potentiostatic mode of electrodeposition. Manganese oxide nano-grains with various diameters were obtained by the electrodeposition method. The films were deposited at deposition potential of 0.9 V vs *saturated calomel electrode* (SCE). The deposition time controls the diameter of the nano-grains within the range of 30–32 nm. Electrodeposited Manganese oxide nano-grains thin films were grown at 60 ^{0}C. Their structural, morphological and supercapacitive properties are studied. The deposited films are utilized as a supercapacitive electrode in 1 M KOH aqueous electrolyte. The analysis showed that, the prepared electrodes are good candidate for supercapacitive study. The electrodeposited Manganese oxide film has maximum specific supercapacitance of 295 F/gm.

Keywords: Manganese oxide, electrodeposition, supercapacitor, nano-grains.

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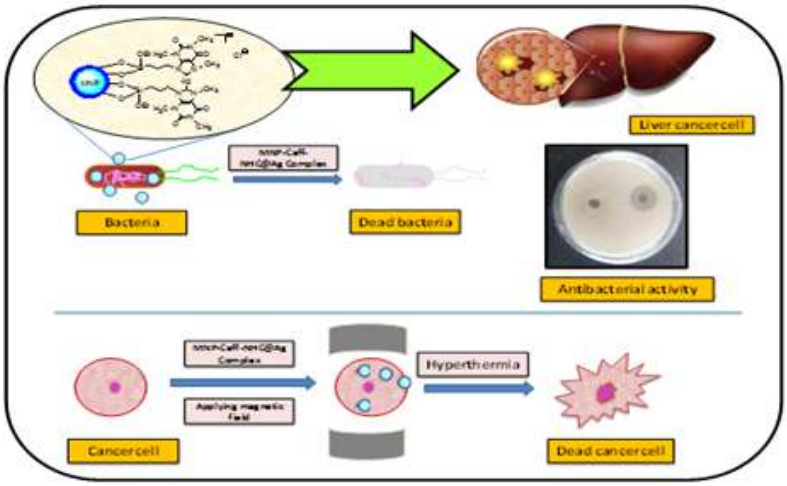

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Keywords: Manganese oxide, electrodeposition, supercapacitor, nano-grains.

REVIEW OF *SPIRULINA* AS POTENTIAL SOURCE OF NUTRACEUTICALS, FUNCTIONAL FOODS AND FOOD SUPPLEMENTS

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Abstract

Spirulina is an incredible natural source of nutrition which has been used since ancient times. It's high content of proteins, vitamins, antioxidants, antimicrobials and anti-carcinogenic biomolecules is being researched upon. *Spirulina* is a filamentous multicellular cyanobacteria and have bioactive compounds like protein, vitamins, pigments, long chain polyunsaturated fatty acids, sterols and other compounds that make this microalgae very interesting from the health benefits point of view. Studies showed that *Spirulina platensis* or its extracts could possess physiological profits as antioxidant, antimicrobial, anti-inflammatory, antiviral or antitumor properties. The use of *Spirulina* as food products has been increasing due to concerns regarding health and safety issues. Many food products can be produced by the use of microalgae or their bio-compounds. This microalgae can also be used for animal nutrition. *Spirulina* can be also applied in fish feed providing an increased growth rate.

TRANSGENESIS

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Abstract

Transgenic animal have become a key tool in function genomics to generate models for human disease and validate new drugs. transgenic organism have a multitude of uses they are used in medicine to produce insulin, inject vaccine into food to avoid the difficulty of administrating shots, and to produce hormone that treat disease

Microinjection is an essential approach in the study of mammalian oocytes and early embryos, and is useful for the introduction of many molecules and reagents. Whereas microinjection into germinal vesicle stage oocytes is relatively simple using various microinjection setups, metaphase-II mouse eggs are notoriously fragile, and non-damaging microinjection can be difficult to achieve. Here we describe a microinjection method that is based on electrophysiology, which vastly reduces microinjection damage, especially in metaphase-II eggs. When optimized, this approach allows for over 90% oocyte survival, increasing confidence in experimental results.

LOW POWER COLLISION AVOIDANCE SYSTEM FOR BICYCLES

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India slowly pedalling its way to cycling. Cycling is great option to achieve, change the fitness, and mindset. This also defines the essence of life. Thus, India is fast catching up. Pedalling also provides futuristic solution on power issues. If two and four wheelers are replaced by bicycles for short-distance trips, it positively provides an annual benefit of Rs.1.8 trillion. Nevertheless, Cyclists in India are bullied badly by all the other modes of commuters. As a result, commuter's don't think of cyclists at all. The primary focus on roundtable was the safety and general health of people riding bicycles on public roads for commuting . As we also know that in now days every one has other vehicles like four wheelers and two wheelers but most in rural areas they still uses bicycle for commuting. e.g. most students use bicycle for school and college. Also as the number of cyclists increaseing with a relative fatal accidents.To previous ITF research on cycling safety, a discussion on the health risks of cycling.The number of cyclists killed road traffic has risen in recent year, according to report from several countries. There are various devices for their safety but they are costly and not feasibly. this project approaches to improving the safety cyclists.The proposed work is a microcontroller-based safety system for a cyclist. The MSP430 microcontroller and 4 ultrasonic sound sensors are devised for the development of proposed system.This system alerts the cyclist when another vehicle or obstacle is very close to them. The proposed system measures the secure distance between bicycle and other vehicles, and obstacles. The system low power, also we can we can save power through switch or ON-OFF circuit. We can enable the system whenever the user useing the cycle on road and we can OFF it when the cycle is parked or In traffic areas. So we can save the power through this idea the system is reliable.

Keywords :
Cycling safety, Low power collision,MSP430G2553, Ultrasonic sensor, Proximity

RICE SEED BANK

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Abstract

Rice is the major food crop cultivated in india. Rice productivity is significantly lower than the national average owing to many reasons among which lack of availability of quality seeds of high yielding varieties is the major one. Since the high genetic purity seeds produced by the government institutes in the state are too meagre to meet the huge demands, the concept of farmer seed Producer Company is being proposed. At present, only one farmer producer company for paddy is operating in the state, but the number of FPCs for paddy needs to be increased. How efficiently the concept of FPC for quality rice seed production can be adopted in the discussed in this paper. With the technical inputs from government institutes like ICAR-Regional Rainfed Lowland Rice Research Station, the farmers of the state themselves can produce the required rice seeds. This will not only ensure the timely availability of quality rice seeds of the improved varieties, but will also help in the long term to achieve the proposed target of doubling the income of rice farmers in the state.

Key words: Rice, Farmers Producer Company, quality seed, improved varieties, income.

Extraction of Essential Oil for Aromatheropy

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Murud-Janjira, Raigad

Abstract

Essential oil or volatile oils are extracted from the flowers, leaves, fruits and other parts of the plant by steam method. Nowadays, use of alternative and complementary therapies with mainstream medicines has gained the momentum. Aromatherapy is one of the complementary therapy which use essential oil as the major therapeutic agents to treat several diseases. Aromatherapy is the therapy utilizes various permutations and combinations to get relief from depression, headache, insomnia, muscular pain, skin aliments, swollen joints etc.

Keywords: Essential oil or volatile oil, complimentary therapy, steam method.

Investigations on Spray Deposited Sn_xS_y Thin Films

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Abstract

Tin sulfide is one of the most important materials for low-cost thin film Solar cell applications. Thin films of tin sulfide (Sn_xS_y) have been spray deposited at optimized substrate temperature of 200 °C by varying Sn:S ratio. The structural and optical properties Sn_xS_y thin films are studied through X-ray diffraction and UV-Vis spectroscopy. X-ray diffraction spectra revealed the polycrystalline nature of Sn_xS_y thin films with orthorhombic crystal structure. The optical band gap of Sn_xS_y thin films varies from 1.43 to 2.0 eV with change in Sn:S ratio. The structural and optical properties of Sn_xS_y thin film shows that these films can be utilized in thin film solar cells.

Keywords: Chemical Spray Pyrolysis; Thin Films; SnS; Optical Properties; XRD;

IOT BASED AUTOMATIC SOLAR PANEL CLEANING SYSTEM

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ABSTRACT

The internet of things (IoT) is the most widely used technology for control and data acquisition through internet. The cleaning of the solar panels at the solar power generation plant is the most important parameter in maintaining the solar generation capacity. The IoT based solar panel cleaning system is developed. As the dust on the solar panel increases, the absorbance of the panel decreases resulting in generation of less amount of energy. Cleaning of solar panels at large scale requires more manpower for cleaning the panels. We have placed the data of the sensors is placed over the internet. The proposed system uses servo motors and a submersible pump for cleaning the solar panel automatically. The LDR is used to collect the reflection from the panels to acknowledge the dust on the panels. The data from LDR is uploaded on IoT using Blynk application. We can get the real-time acknowledgement of the dust on panels and we can clean the solar panels as per our requirement without any manpower from anywhere using IoT.

Keywords: IoT; Solar panel; Blynk Application; LDR

SYNTHESIS OF ALKYL ARYL ETHERS USING MAGNETIC NANOPARTICLES SUPPORTED *N*-HETEROCYCLIC CARBENE-NICKEL COMPLEX

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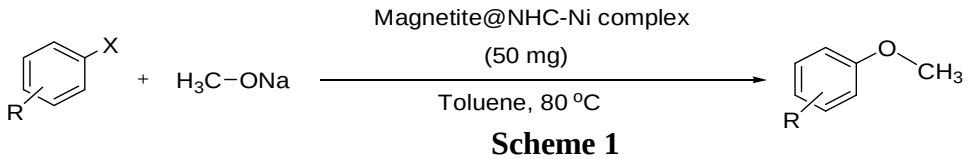
Abstract:

Alkyl-aryl ethers are important structural scaffolds employed in diverse fields such as agrochemical and pharmaceutical industries. In view of their fascinating properties, a variety of synthetic strategies has been continuously reported for efficient synthesis of alkyl aryl ethers. However, despite noteworthy progress, some drawbacks are associated with most of reported protocols. Therefore, the efficient method for synthesis of alkyl aryl ethers especially using highly robust heterogeneous complex is highly desirable.



Scheme 1

In the present work, we have prepared magnetic nanoparticles supported *N*-heterocyclic carbene-nickel complex. The complex has been characterized different analytical techniques such as FT-IR, SEM, XRD, TGA and EDX analysis. The catalytic activity of complex was explored in the synthesis of alkyl aryl ethers from aryl halides and sodium methoxide (**Scheme 1**). This protocol offers several remarkable merits such as good yields, operational simplicity and efficient recovery of complex with the aid of an external magnet.

USE OF CRYPTOGRAPHY IN CLOUD COMPUTING

Kadu Sarah Imtiyaz[1], Killedar Bisma Nazim[2]

(1-Assistant Professor, 2- Student)

Anjuman Islam Janjira Degree College of Science

Murud-Janjira, Raigad

Abstract: Cloud computing is a platform for expanding capabilities and developing potentialities dynamically without employing new infrastructure, personnel, or software systems. In Addition, cloud computing originated from a commercial enterprise concept, and developed into a flourishing IT invention. However, given that considerable information on individuals and companies are identified in the cloud, concerns have been raised regarding the safety of the cloud environment. Despite the hype surrounding cloud computing, customers remain reluctant to deploy their commercial enterprise into the cloud. Nevertheless, lack of protection is the only major concern that hinders increased use of cloud computing. Furthermore, the complexity with which cloud computing manages data secrecy, and information security makes the market hesitant about cloud computing. The architecture of cloud models threatens the security of existing technologies when deployed in a cloud environment. Thus, users of cloud services should know the dangers of uploading data into this new environment. Therefore, in this paper different cryptography aspects that pose a threat to cloud computing are reviewed. This paper is a survey of specific security issues brought by the use of cryptography in a cloud computing system.

Keywords: Cloud encryption, cryptographic algorithms, cloud security infrastructure.

DATA WAREHOUSING AND DATA MINING

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(1-Asst. Professor, 2- Student)

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Murud-Janjira, Raigad

Abstract: The aim of this paper is to show the importance of using data warehousing and data mining nowadays. It also aims to show the process of data mining and how it can help decision makers to make better decisions. The foundation of this paper created by doing a literature review on data mining and data warehousing. The models developed based on the knowledge gained from the literature review and a real case implementation. The most important findings are the phases of data mining processes, which are highlighted by the developed model, and the importance of data warehousing and data mining. It can help to get better answers which allow both technical and nontechnical users to make much better decisions. Practically, data warehousing and data mining is really useful for any organization which has huge amount of data. Data warehousing and data mining help regular (operational) databases to perform faster. They also help to save millions of dollars and increase the profit, because of the correct decisions made with the help of data mining. This paper shows the process of data mining and how it can be used by any business to help the users to get better answers from huge amount of data. It shows an alternative way of querying data. Instead of doing regular queries from regular databases, data mining goes further by extracting more useful information.

Keywords: component; Data Mining; Data Warehousing; Operational Database.

Use of LED Based Light Trap for Control of Insect Crop Pest

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Abstract:

LED bulb has more advantages than that of the glowing bulb, Tube light and CFL bulb. LED bulb produces less heat and more light as compared with other light producing devices. LED bulb requires less electricity, environment friendly and very cost effective. LED are available are multi-colored and easily available. Considering these fact LED bulbs are used to construct multispectral light trap to attract insect crop pest. By using LED based insect trap is designed to attract various kinds of insect crop pest. As we know insect has affinity to attract toward particular light sources. The light trap is constructed in such a way that insect can visualize spectra of LED light from any direction.

The objective of the light trap is to contribute reduction of the amount of pesticides used in agriculture and the related hazards to human health and environment. The insect light trap is one of the effective tool of insect pest management as it useful for mass –trap of various kinds of insect including both the sexes of insect pests ,which subsequently reduced to carried over pest population. The light trap are a very effective way to collect insect at night. The light attracted most of the crop pest species such as leaf roller steam bore, leaf hopper, moth, beetles, etc.

Key words: Light trap, Coleoptera, Crop pest,

IoT Networking Technologies

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Asst.professor

Anjuman Islam Degree College of Science

Murud-Janjira

Abstract :

This paper gives insight into how IoT networking is unique combination of wireless personal area network, like 6LowPAN, Zigbeeprotocol.which runs the Medium Access Control and the physical layer operation for6LoWPAN and ZigBee connectivity. In addition, this paper discusses about wireless LAN Wi-Fi technology, i.e. wireless local area network protocol and on a larger scale, mobile communication technology, such as LTE, that is used to provide connectivitytothe internet, the wide area network. This paper focuses on how these technologies need to work together to provide IoT connectivity. It showcases important research challenges in said area.

Keywords : IoT, PAN, Bluetooth, ZigBee, 6LoWPAN, Wi-Fi, WLAN, IEEE802.15.4

RICE HUSK ASH: A SUSTAINABLE FEEDSTOCK MATERIAL FOR ORGANIC TRANSFORMATION

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Abstract:

The recent quest towards the implementation of green methodologies in synthetic chemistry has spurred an extensive interest in the multicomponent reactions. Recently, a great deal of attention has been focused on the use of employing bioresource based feedstock material as a catalyst in synthetic chemistry. Such methodologies are able to manage dual goals such as environmental protection, as well as economic benefit. In present work, we have prepared RHA-SO_3H as solid acid catalyst and its catalytic potential was evaluated for the synthesis of 1,8-dioxo-octahydroxanthenes *via* one-pot synthesis of aromatic aldehyde and dimedone using ethanol under reflux condition. High conversion, shorter reaction time, cleaner reaction profile, environmentally benign solvent, simple experimental and work-up procedure are the striking features of our synthetic route.

Keywords: RHA, Bioresource feedstock, Green protocol, 1,8-dioxo-octahydroxanthenes.

Glycerol as green solvent strategy for facile ,high product yield and selectivity: A mini review.

Shoyeab Khan

Anjuman Islam Degree College of Science

Murud-Janjira

Abstract:

Glycerol, which is a non-toxic, biodegradable, and recyclable liquid manufactured from renewable sources, has a high potential to serve as alternative green solvent for organic reactions and synthesis methodologies. High products conversions and selectivity's were achieved. A huge number of synthetic transformations have been conducted in glycerol in recent years, showing most of them having similar or even superior efficiency and selectivity than those performed in conventional petroleum-based organic solvents.

Keywords: Glycerol, Green solvent, catalytic reduction, Ethyl acetate, petroleum-based

PREPARATION AND CHARACTERIZATION OF TRAMADOL HYDROCHLORIDE MICROSPHERES

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ABSTRACT:

The purpose of this work was to design a controlled-release drug-delivery system for the Tramadol HCl. Tramadol HCl was encapsulated using different EC (Ethyl Cellulose), HPMC K4M (Hydroxylpropylmethylcellulose) and CAP (Cellulose Acetate Phthalate) polymers by an emulsion solvent evaporation technique and the physicochemical properties of the formulations were characterized. Using a solvent evaporation method, white spherical microspheres were produced. The *in vitro* drug release was studied phosphate buffer pH 6.8 for 8 hours. The formulations were then evaluated for their pharmacokinetic parameters. The entrapment efficiency of these microspheres was between 71.89 % to 85.52 %. The obtained microspheres showed good flow properties, which were evaluated in terms of angle of repose, bulk and tapped densities, Carr's index and Hausner's ratio. Particle size and drug release depended on the nature and content of polymer used. The drug release mechanism of the Tramadol HCl formulation can be explained using the zero order, First order, Higuchi model and Korsmeyer Peppas model. The controlled release of drug from Tramadol HCl microsphere provides for higher plasma drug content and improved bioavailability.

Keywords: Tramadol HCl, Opioid analgesic, Solvent evaporation, Drug release Kinetics.

Supercapacitive Study of Electrodeposited Polypyrrole Thin Film |

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c Nano-Composite Research Laboratory, K.B.P.Mahavidyalaya, Pandharpur (MH)-413303

***Corresponding Author's e-mail address:** Pravink150@gmail.com (**PMK**)

Abstract:

In the present investigation, we reports synthesis and characterization of Polypyrrole (PPY) thin film electrode by galvanostatic electrodeposition method for supercapacitor application. The crystal structure and the surface morphology Polypyrrole (PPY) thin film electrode was carried out with help of X-ray diffraction (XRD) and scanning electron microscopy (SEM) techniques. The XRD study shows the amorphous nature of Polypyrrole (PPY) thin film. The SEM images of PPY thin film show cauliflower like morphology.

. Supercapacitive study of PPY thin film electrode was carried out by using different characterization techniques such as cyclic voltammetry (CV), galvanostatic charging-discharging (GCD) and electrochemical impedance spectroscopy (EIS) study. The PPY thin film electrode shows maximum specific capacitance of 360 $F.g^{-1}$ at scan rate 20 $mV.s^{-1}$ in 0.5 M Na_2SO_4 electrolyte. Hence, galvanostatistically deposited PPY thin film electrode is best for energy storage application.

Keywords: Supercapacitor, Electrodeposition; Conducting Polymer; Scanning Electron Microscopy; Charging-discharging study.

Electrochemical Study of Electrodeposited Manganese oxide (MnO_2) Thin Film |

P. M. Kharade[a*], T.R.Mane[b], J.V.Thombare[c], S.S.Dhasade[c], B.B.Navale[c], D. J. Salunkhe[d]

a Department of Physics, Shankarrao Mohite Mahavidyalaya, Akluj (MH)- 413101

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Abstract:

The present paper reports electrochemical synthesis of Manganese oxide (MnO_2) thin film electrode by electrodeposition method for supercapacitor application. The crystal structure and the surface morphology of Manganese oxide (MnO_2) thin film electrode was carried out with help of X-ray diffraction (XRD) and scanning electron microscopy (SEM) techniques. The XRD study shows the cubic nature of Manganese oxide (MnO_2) thin film. The SEM images of Manganese oxide (MnO_2) thin film show nanoflakes like morphology.

. Supercapacitive study of Manganese oxide (MnO_2) thin film electrode was carried out by using different characterization techniques such as cyclic voltammetry (CV), galvanostatic charging-discharging (GCD) and electrochemical impedance spectroscopy (EIS) study. The Manganese oxide (MnO_2) thin film electrode gives maximum specific capacitance of 290 $F.g^{-1}$ at scan rate 50 $mV.s^{-1}$ in 0.5 M Na_2SO_4 electrolyte. Hence, Electrodeposited Manganese oxide (MnO_2) thin film electrode is good for energy storage application.

Keywords: Electrochemical Capacitor; Electrodeposition; Metal Oxide; Scanning Electron Microscopy; Charging-discharging study.

ETHNOBOTANICAL SURVEY OF WILD EDIBLE PLANTS FROM RAIGAD DISTRICT.

Dr. Swati S. Kharade

Asst.professor

Anjuman Islam Janjira Degree College of Science

Murud-Janjira

Abstract

The present study deals with the identification, documentation and ethno-botanical exploration with respect to food value of wild edible plants from raigad district. Total 30 wild edible plants were surveyed. Edibles parts of wild plants (fruit, flower, leaves, tubers and inflorescenes) are the nature's gift to mankind. These wild deibles are delicious, refreshing & rich source of vitamin, orinerals and protein. Some of these wild edibles has declined, it is considered that much attention towards maintain and improve this important source of food supply.

Keywords: Ethnobotany, wild edible plants, raigad district.


Earth
Co
Fe
Zn

PORTABLE WATER QUALITY TESTING USING MICROCONTROLLER (ARDUINO)

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Abstract :

Water is primary need of all living beings and living without water is impossible . With advancement of technology and industrialization, environment pollution have become a major concern. Water pollution is one of the most serious type of this environmental pollution. Our lives depends on the quality of water that we consume in different ways, from juices which are produced by the industries and we consume, to the water supply in our houses.

Safe And Readily Available Water Is Important For Public Health Whether It Is Used For Drinking, Domestic Use , Food Production. Improved Water Supply & Sanitation, & Better Management Of water Resources Can Boost Countries, Economic Growth & Can Contribute Greatly To Poverty Reduction. For overcome this problem we are use a simple water quality monitoring method where sensor can be used, sensor based water quality testing has many advantages such as high sensitivity, good selectivity, speed, fast response, etc.

The system should be monitoring in real time. To make the process of testing the real-time quality of water simple and easy for everyone, a remote, low cost, and portable water quality monitoring system is designed and developed .

- **PH :-** A Measurement Of The Level Of Acidic Or Alkali In a Substance.
- **Turbidity :-**

  Turbidity is The Cloudiness Or Hardness Of The Fluid Caused By Large No Of Individual Particles That are Generally Invisible To The Naked eye , Similar To Smoke In Air.
- **Unit :-** NTU – Nephelometric Turbidity Unit.

SYNTHESIS & PHARMACOLOGICAL SCREENING OF NOVEL CARDIOVASCULAR HYBRID DRUG

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Abstract :-

Heart disease and stroke are respectively the first and the third leading causes of death in the USA and have an enormous financial and social burden therefore; the aim of antihypertensive therapy is to reduce the incidence of major events, including mortality. The use of a therapeutic agent alone in the treatment of a disease may be limited by side effects caused by its own action. The principle of combination drug therapy can be achieved by either using concomitant administration of two or more single active drugs or by designing drugs in which more than one active pharmacophore are combined in one molecule. These hybrid molecules often consist of different pharmacophoric groups linked to each other via spacers. A small series of 2-(4-[{3 aryloxy}-2-hyoxypropylamino] phenyl)-2-oxoethyl nitrate (**5a-f**), dimethyl-1-(2-hydroxy-3-[naphthalene-1-yl oxypropyl]-2, 6-dimethy-4-(nitro phenyl)-1, 4-dihydropyridine-3, 5-dicarboxylate (**5g**) and 2-(4-[2-hydroxy-3-{nicotinamido} propylamino] phenyl)-2-oxoethyl nitrate (**5h**) by using NO donors possessing vasodilator activity and propanolamine having в-blocking activity were synthesized and evaluated for their effect on lowering blood pressure, ECG & heart rate. Structure activity relationship data showed that the compounds with less bulky and electron donating substituent on the phenyl ring and naphthalene ring attached to propanolamine chain has shown significant hypotensive effect compared to compounds with substituent's like hydroxyl and nitro group.

Synthesis of Vinyl Sulfones via Knoevenagel Condensation between Aldehyde and Phenyl Sulfonyl Acetonitrile

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Abstract: Sulfones are important and versatile intermediates in organic synthesis for construction of various fine chemicals, biologically significant compounds, agrochemicals etc. As well as they are a core functional group in both organic and medicinal chemistry. More specifically, Vinyl sulfones are valuable intermediates and useful building blocks in the synthesis of biologically active compounds, such as cysteine proteases, HIV-1 integrase, and antibiotic TAN-1085. In recent years, vinyl sulfones (б, в-unsaturated sulfones) have attracted considerable interests in the area of synthetic organic chemistry, owing to their important role in serving as key structural units of many biological active compounds as well as versatile building blocks for various organic transformations. Therefore, considerable effort has been devoted to the development of new and efficient methods for the synthesis of vinyl sulfones. The traditional methods mainly include: oxidation of vinyl sulfides, в-elimination, and cross-coupling of the sulfonyl derivative with an alkenes or alkynes source. However the reports on synthesis of vinyl sulfone via Knoevenagel condensation using sulfonyl functionalized active methylene compounds like phenyl sulfonyl acetonitrile is scanty. The utility of Phenyl sulfonyl acetonitrile lies in its structure, as it carries cyano and sulfonyl group. Cyano group can be easily transformed into other functionality, while sulfonyl group is good leaving group. It can be removed easily by hydrolysis, reduction or substitution reaction. In addition both sulfonyl and cyano group induce remarkable activation effect on the substrate by stabilizing adjacent carbanion. Therefore efforts were made to develop very simple protocol for synthesis of substituted vinyl sulfone through piperidine catalyzed Knoevenagel condensation between aromatic aldehyde and phenyl sulfonyl acetonitrile at room temperature. High conversion, operational simplicity, ease of workup and clean reaction profile are the notable features of developed protocol.

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ANTIBACTERIAL ACTIVITY & PHYTOCHEMICAL SCREENING OF AQUEOUS EXTRACT OF LEAVES OF PLANT VITEX NEGUNDO

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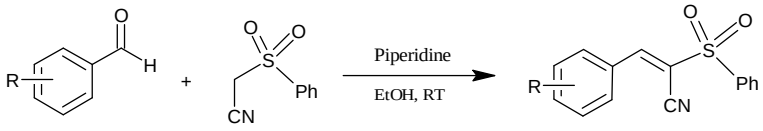
Abstract:-

Presently available synthetic antibiotic are found to have serious side effects as Bone Marrow, Depression, Anemia and damage to vital organ like Liver and Kidney. So, it is mandatory to identify newer antibiotic from herbal sources which are devoid of such side effects *Vitex negundo* belongs to family-verbenaeceae. It is one of the common plants used in Indian system of medicine. It is used in Ayurveda as anti-inflammatory, analgesic and anti-itching agent internally and externally. In the present study, an attempt has been made to test the invitro antibacterial activity of *vitex negundo* against to bacteria *Staphylococcus aureus* and *Klebsiella pneumoniae*. Aqueous extract showed presence of alkaloids, cardiac glycosides and phenolic compounds and tannins in the leaves of extract of *vitex negundo* as vital chemical constituents. Aqueous extract of leaves of *vitex negundo* showed antibacterial activity as reflected from invitro antibacterial study(by Cup Plate method) against *Klebsiella pneumoniae* and *Staphylococcus aureus*. Hence this plant can be used in the treatment of human diseases caused by the above used microorganisms.



Structural and Optical Studies of Undoped and Nickel doped ZnO Nanostructure thin films produced by Spray pyrolysis method

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Abstract

This exploration deals with the effect of Nickel (Ni) doping (0%, 3%, 5%) on structural and optical properties of ZnO nanostructure thin films prepared by Spray pyrolysis technique. The recorded patterns of XRD indicate that all undoped and Nickel doped ZnO nanostructure films were hexagonal wurtzite structure with polycrystalline nature. The most intense peak is found to be oriented along (002) plane. The grain size was decreased from 20 nm to 19 nm from 0% to 5% doping of Ni. Optical studies show that optical band gap values were ranging from 3.22 eV to 3.09eV for respective Ni doping concentrations. As concentration of Ni content increased, transmittance for Ni doped ZnO nanostructure thin films decreased.

Keywords: Thin films; ZnO; nanostructure; structural properties; transmittance.

Synthesis & Characterization of ZnO Nanoparticals Via Simple Wet-Chemical Routes

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Abstract

Zinc Oxide nanoparticals (ZnO_{NP}) have been deposited by simple wet-chemical method from the zinc nitrate solution at 60^{o}C on ITO coated glass substrates. Synthesized thin films were annealed at 500^{o}C for 5 hr. The obtained thin films have been characterized by X-ray diffraction (XRD) and scanning electron microscope (SEM). XRD pattern showed preferential orientations along (002) crystallographic plane which revealed polycrystalline hexagonal nature of the film. From XRD analysis grain size was calculated 65 nm. SEM micrograph clearly showed the formation of highly oriented ZnO_{NP} having hexagonal morphology. From SEM images it can be seen that the average particle size ranging from 20 nm to 2 ìm.

Keywords. ZnO nanoparticals, wet-chemical method, XRD, SEM

ANALYSIS OF HEAVY METALS IN PLANT SAMPLES AND WATER PARAMETERS OF RANKALA LAKE

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Abstract:

The aim of our work is to study of the water quality of Rankala Lake by considering different water parameters. Also to study the heavy metals present in water and aquatic plants such as Eichhornia, Hydrilla and Salvinia present in Rankala Lake. Our interest was to find whether there are any observable changes that have occurred in water quality due to removal of aquatic plant beds from the lake. The investigation about physiochemical parameters and presence of heavy metal ions in water body (Rankala Lake) are analyzed in this work .

Keywords: Water parameters, Heavy metals, Rankala lake.

Utility of Drug Discovery in Medicinal and Organic Chemistry

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Murud-Janjira, Raigad

Abstract

Drug design is a creative science, a special technology, and an art all in one. Design of highly proficient chemical reaction sequences that give functionalized bioactive heterocyclic motifs with interesting pharmacophoric properties is a major challenge of recent drug discovery. Organic synthetic and medicinal chemists are screening a large number of newer molecules in the lab but very few can pass through the vigorous journey of drug discovery pipeline from lab to market. He pipeline of drug discovery from idea to market consists of seven basic pathways: disease selection, target selection, lead molecule, lead optimization, preclinical trial testing, clinical trial testing and pharmacogenomic optimization. In present academia, biochemical, and pharmaceutical industry all contribute to drug discovery. He important for the pharmaceutical and biochemical industry to discover breakthrough drugs is matched by the increasing number of first-Ln-cODss drugs approved in recent years and reflects the impact of modern drug discovery, methods, technologies, and genomics.

Keywords: Drug design, chemical reaction, drug discovery, medicinal chemistry, biochemical, pharmacogenomic.

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SYNTHESIS OF SPINEL COPPER-MANGANESE FERRITE BY AUTO-COMBUSTION METHOD

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Abstract:

The Spinel structured Copper-Manganese ferrite $Mn_{0.8}Cu_{0.2}Fe_2O_4$ have been synthesized by auto combustion method and characterized by using XRD (X-ray diffraction), TGA (Thermo gravimetric analysis). The X-ray diffraction pattern confirms the existence of single-phase cubic spinel crystal structure of ferrite with lattice parameter of 8.43 E. The particle size of synthesized $Mn_{0.8}Cu_{0.2}Fe_2O_4$ is ranging from 12 nm to 20 nm which is good agreement of the theoretically predicted size of nanomaterials. Thermo gravimetric analysis shows maximum total weight loss observed for oxide and their corresponding temperature.

Keywords: Spinel ferrites, Copper - Manganese Ferrite ($Mn0.8Cu0.2Fe_2O_4$), auto combustion method, etc.

Biodegradable bags: Alternative to plastic bags

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Anjuman Islam Janjira Degree College Of Science

Murud-Janjira, Raigad

Abstract

Thousands of plastic factories are producing tons of plastic bags which are very popularly used by the people for shopping purposes because of its ease, cheapness and convenience of use but their very hazardous negative impact is never highlighted or, at the very least, openly discussed in a more serious tone. Many countries have banned plastic bags due to public concern over the serious negative impact on the environment and agriculture, especially, in agricultural countries, such as Bangladesh, India, Pakistan, South Africa, etc This study is concerned with While plastic bags have been very widely used, there has been a recent shift to paper bag products and cloth bag products because of their cost and the fact that they are environmentally-friendly and biodegradable. “Fashion always changes with standard paper bags and cloth bags”. So demand for paper and cloth would go on increasing in times to come.

Key words: Biodegradable, environmentally friendly, hazardous, convince.

Characterization and investigation of the catalytic potential of Pomegranates peels ash for water promoted synthesis of densely functionalized 2-amino-4*H*-chromenes

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Abstract:

A simple and green protocol was developed for one-pot multicomponent synthesis of 2-amino-4*H*-chromenes using Ash of Pomegranate Peels (APP) as a non conventional catalyst by reaction of aromatic aldehydes, malononitrile, 4-hydroxy coumarin under aqueous conditions. The Pomegranate peels are obtained from renewable resources as a bio-waste material. The catalyst was prepared by simple thermal treatment and characterised by FT-IR, XRF, XRD, SEM, BET, EDS and DSC-TGA analysis. The APP content some metal oxides which synergetically catalyze the reaction. The catalyst can be recycled upto 5 times with little deactivation. The renowned methodology was further utilized by nearer future in organic transformations.

SYNTHESIS OF SILVER DOPED ZINC OXIDE NANO-MATERIAL AS GAS SENSING AGENT

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[2,]Department of Physics, Sangola College Sangola

[3]Department of Physics, S.M. College, Akluj

[4]Department of Physics, C. T. Bora College Shirur

Abstract:

Nano crystalline materials have fascinated a wide consideration due to their unique properties and enormous potential applications in the fabrication of nano devices. In the present work, we reported that the synthesis of silver doped zinc oxide nanomaterial by hydrothermal method and their gas sensing property have also been examined. The developed nanomaterial is of great scientific importance for further studies as promising contenders for fabricating multifunctional gas nano-sensors.

Keywords: Hydrothermal method, Silver doped zinc oxide, Gas sensing

Introduction:

Nano materials are considered as brilliant adsorbents, catalysts and sensors by motive of their large specific surface area and great reactivity. In the recent years, the applications of nanoparticles are developed in several fields such as cell labeling, drug targeting gene delivery, micro-electronics and solar cells and so on. The solid state gas sensors work on the principle of change in physical or chemical properties of their sensing materials have been exposed to different gas atmospheres. Although a large number of materials have been utilized to implement these devices, the work is being specifically focused on studying the metal oxide semiconductor such as SnO_2, TiO_2, ZnO, WO_3, etc materials. Among these, transition metal oxides such as SnO_2, TiO_2 and ZnO appear to most suitable candidates for semiconductor gas sensors [1, 2]. Among the metal oxides, ZnO is unique due to its duel semiconducting and piezoelectric properties [3] and also one of the most widely used as gas sensing materials due to its low fabrication cost and high electron mobility [4-5]. Synthesis process of Ag:ZnO Nano composite play a key role in governing size, morphology and its properties of Nano composite through dispersion method

(pulse mode), ultra sonication [6]. Their results designated that at higher temperatures a competitive progression controls the removing of reabsorbed oxygen molecule from the surface and this competition is responsible for the resistive converting behavior in the ZnO based gas sensors. Gas sensitivity of this kind of materials is affected by the surface states and their morphology. Therefore, an increasing interest in nanomaterial for gas sensing was demonstrated [7-8]. In the present work, we reported that the synthesis silver doped ZnO nanomaterial by hydrothermal method and their gas sensing property have also been examined.

Experimental Procedure of Silver Doped Zinc Oxide Nano-Material:

Hydrothermal method was applied for the synthesis of Silver Doped Zinc Oxide Nano-Material. The detail of the synthesis process is given in the following flow chart;

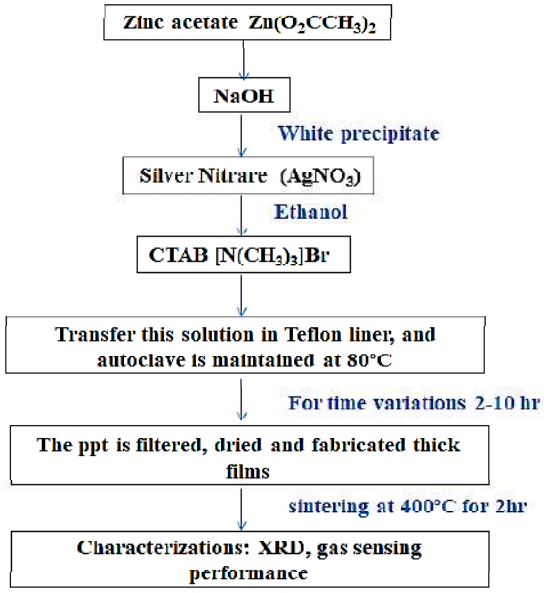

Chart 1: Hydrothermal synthesis of Silver Doped Zinc Oxide Nano-Material

Gas Sensing Mechanism:

The gas sensing mechanism can be explained as follows. When ZnO nanostructured sensors are exposed to air, oxygen molecules get adsorbed on the surface and form O", O2" and O2" by capturing free electrons from the conduction band, which results in a high resistance in air. When the semiconductor surface is exposed to reducing gas (such as ethanol) at appropriate temperature, ethanol may react with the surface oxygen species. Thus, the electrons trapped by O" are released and returned zinc oxide. The reaction leads to decrease in resistance of ZnO

nanostructure. The ethanol sensing mechanism of this ZnO based gas sensor can be summarized as follows;

$$CH_3CH_2OH_{(ads)} + 6O \longrightarrow 2CO_2 + 3H_2O + 6e^-$$

As far as the effect of Ag doping is concerned the gas sensing performance of ZnO can be explained by the defect chemistry model of acceptor-doped zinc oxide. The highly conductive nature and availability of free electrons in Ag would also cause more electrons to be extracted by adsorbed oxygen. Thus, in the presence of Ag more electrons are extracted, which produce a deeper electron-depleted layer in zinc oxide. In addition, the Ag doped ZnO nanostructure has large surface-to-volume ratio and has a high density of active adsorption sites, which helps in showing a relatively higher response than un-doped zinc oxide.

Gas Sensing Properties of Silver Doped Zinc Oxide Nano-Material:

The response initially increases linearly with acetone conc. and attains saturation after 1000 ppm. At lower gas concentrations the uni-molecular layer of gas molecules forms on the surface of the sensor, which interacts more actively and thus might be giving larger response. The multilayer of gas molecules formed on the sensor surface at higher gas concentrations would result in saturation of response beyond 1000 ppm as shown below;

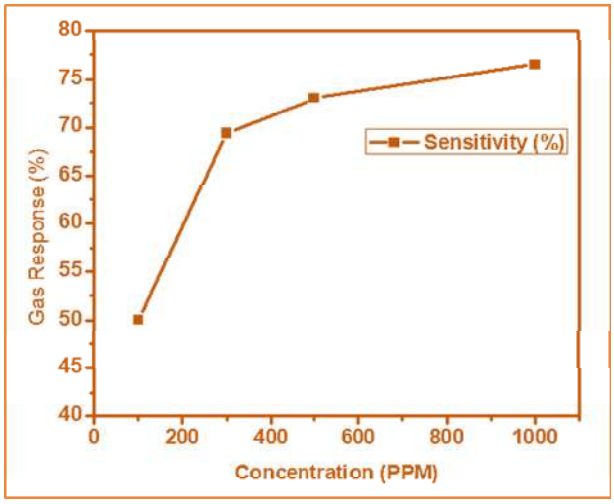

Fig 1: The plot of gas response vs acetone gas concentration sample of ZnO at 325˚C

Figure shows the response for ZnO samples as a function of acetone concentration at 325єC. The response increases linearly as concentration of acetone increased from 100 to 1000 ppm. The slope of all the graphs decreased with concentration which is due to occurrence of saturation in the response. With a small concentration of gas, exposed on a fixed surface area of a sample, there was a lower coverage of vapor molecules on the surface and hence less surface reaction occurred. An increase in vapour concentration increases the surface reaction due to a larger

surface coverage, beyond a certain concentration the increase in surface reaction will be gradual, where the saturation point on the coverage of molecules was reached and we observed constant response above a certain concentration

For 5% Ag doped ZnO Gas sensing properties of Ag- ZnO films Effect of operating temperature

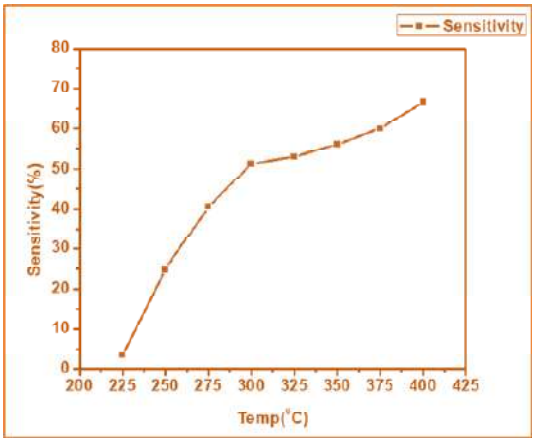

Fig 2: The plot of acetone gas response as a function of operating temperature for Ag-ZnO at 1000 ppm concentration

Effect of Gas Concentration

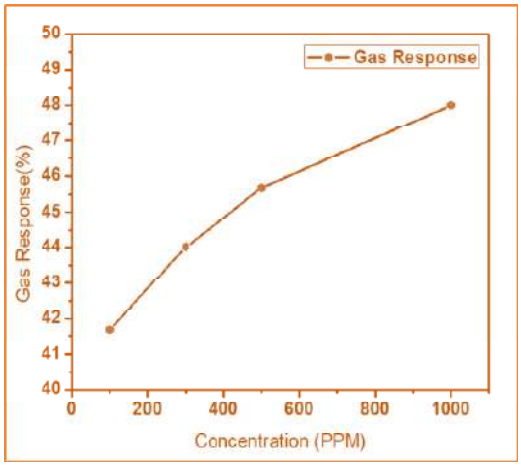

Fig 3: The plot of gas response verses acetone gas concentration sample of Ag-ZnO at 325˚C

Result and Discussion:

Thin films of Nano crystalline ZnO with hexagonal morphology were successfully deposited by hydrothermal method. Structural study revealed formation of Nano crystalline ZnO with predominant orientation along the (002) plane. Structural, morphological, optical and gas response properties are strongly influenced by concentration of the precursor solution. The results demonstrated that the 6hr sample of ZnO sensor exhibited excellent acetone response with small response and recovery time as compared with the sensors. In conclusion, the hydrothermal method proved its versatility in yielding Nano crystalline thin films which can be realized as reliable sensor elements in acetone sensing applications

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CHEMICALLY DEPOSITED BI_2O_3 THIN FILMS AS SUPERCAPACITIVE ELECTRODE

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Abstract

The search for sustainable and renewable means of energy production has led to the development of various energy conversion technologies such as windmills, solar cells, fuel cells, etc. However, these energy sources are intermittent making energy production difficult to match the pattern of the global energy demand. Thus, storing energy and its use when required is the best alternative. With this motivation, extensive work is being done in the development of efficient energy storage technology. Recently, energy storage devices such as lithium-ion batteries (LiBs) and supercapacitors (SCs) are explored as excellent energy storage devices. Amongst, these energy storage devices, supercapacitors are considered to be the most suitable energy storage devices due to their interesting properties like high power density, fast charging-discharging, long cycle life, high reliability, and improved safety. Furthermore, the overall performances of SCs depend on the electrode (morphology, size, porosity, uniformity, etc.)-electrolyte (conductivity, viscosity, density, volatility, etc) properties. Therefore, extensive work and renewed attempts focusing on the improvement of the capacitance of the supercapacitors are being made while engineering the wide variety of electrode materials.

Recently, transition metal oxides are considered to be the best candidate materials for electrochemical supercapacitors due to their high specific capacitance coupled with very low resistance resulting in a high specific power, which makes them very appealing in commercial

applications. With this motivation, we have synthesized Bi_2O_3 thin films based electrodes using simple and cost-effective rotational chemical bath deposition. The material was characterized using XRD, SEM and BET. The electrochemical properties were analyzed using CHI instrument. The synthesized Bi_2O_3 electrode shows excellent supercapacitive performance, such as, high specific capacitance, better cycle stability and higher energy density. The significance of the work lies in the fact that this work opens new avenues for scientific research providing new insight for developing strategies for improving energy storage technologies.

Keywords: Nanocrystalline Bi_2O_3, Thin films, Chemical synthesis, Supercapacitor

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SYNTHESIS AND CHARACTERIZATION OF MANGANESE-COBALT CO-DOPED ZINC OXIDE NANOPARTICLES USING CO-PRECIPITATION FOR PHOTOCATALYTIC DEGRADATION

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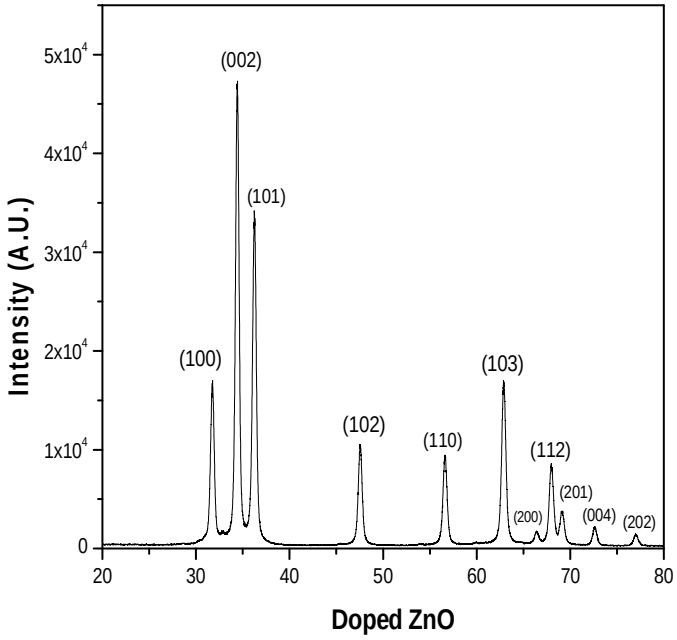
Abstract:

The doping of metal oxides with Manganese and Cobalt is an effective way of enhancing the physicochemical properties of ZnO nanoparticles. The ZnO nanoparticles were prepared using co-precipitation method with different doping concentrations of Mn and Co. Prepared samples are characterized through X-ray diffraction (XRD), scanning electron microscopy (SEM) and Raman spectroscopy. The XRD of ZnO nanoparticles confirms the hexagonal wurtzite structure. The XRD results indicated that crystallite size increases with doping and found in the range of 35–50/ nm. Scanning electron microscopy illustrated that ZnO nanoparticles were less agglomerated and the average size of nanoparticles was found to increase with doping. Raman spectrum also confirmed hexagonal wurtzite arrangement of all samples. This modification in various properties makes ZnO nanoparticles are best photo catalyst for the safety of our environment from dangerous water pollution.

Keywords: Co-precipitation, XRD, SEM,Raman spectroscopy



FORMULATION AND DEVELOPMENT OF FAST DISINTIGRATING TABLET CONTANING HYDROCHLOROTHIAZIDE.

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ABSTRACT

The aim of this study was to prepare Fast disintegrating tablet containing Hydrochlorothiazide by using Natural supperdisintegrates. The tablets were prepared using micro crystalline cellulose as diluent and aspartame as sweetening agent along with Natural super disintegrate. The superdisintegrant used in this study was Isapghula and Tropicana sag powder. The tablets were evaluated for weight variation, hardness, friability, wetting time, water absorption ratio and disintegration time (DT) and dissolution study. Different concentration of superdisintegrant was used in this formulation as 2.5%, 5%. From the results obtained, it can be concluded that the tablet formulation prepared with 5% with Tropicana sag i.e. 5mg showed fast and higher drug release (97.68%) during in vitro dissolution study. Also the hardness, friability, dissolution rate and assay of prepared tablets (batch F4) were found to be acceptable according to standard limits.

Keyword: Disintegration, Disintegrates, Super disintegrants, Fast disintegrating tab

IMPROVING PRIVACY AND SECURITY IN MULTITENANT CLOUD ERP SYSTEMS

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Anjuman Islam Janjira Degree College Of Science

Murud-Janjira.

Abstract:

This paper discusses cloud ERP security challenges and their existing solutions. Initially, a set of definitions associated with ERP systems, cloud computing, and multi-tenancy, along with their respective challenges and issues regarding security and privacy are provided. Next, a set of security challenges is listed, discussed, and mapped to the existing solutions to solve these problems. This thesis aims to build an effective approach to the cloud ERP security management model in terms of data storage, data virtualization, data isolation, and access security in cloud ERP. The following proposed techniques are used to improve the security for multi-tenant SaaS: database virtualization, implementation of data encryption and search functionality on databases and developed systems, distribution of data between tenant and ERP providers, secure application deployment in multi-tenant environments, implementation of the authentication and developed systems together as a two-factor authentication, and improved user access control for multi-tenant ERP clouds.

KEYWORDS:

ERP, ERP system, ERP problems, ERP security challenges, ERP security solutions, ERP and cloud computing

RESEARCH ON CLOUD DATA STORAGE TECHNOLOGY AND ITS ARCHITECTURE IMPLEMENTATION

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Anjuman Islam Janjira Degree College of Science

Murud-Janjira.

Abstract:

The concept of cloud computing becomes more and more popular in latest years. Data storage is a very important andvaluable research field in cloud computing. This paper introduces the concept of cloud computing and cloud storage as well as the architecture of cloud storage firstly. Then we analyze the cloud data storage technology—GFS (Google File System)/HDFS(Hadoop Distributed File System) towards concrete enterprise examples. In the last part, we illustrate how to improve the traditional file storage method based on eyeOS Web operating system which realizes file distributed storage and fault-tolerant control though HDFS technology of Hadoop.

Keywords*: Cloud Computing; Cloud Storage; Web Operating System; Distributed File System;*

PHYTOCHEMICAL SCREENING OF TECTONA GRANDIS LINN

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Abstract :

Tectona grandis Linn., TLC, Phytoconstituents, HPTLC.Tectona grandis Linn. (T. grandis Linn.) (Family - Verbenaceae) is one of the most famous timber plant in the world the leaves of the plant Tectona grandis Linn. were collected, powdered and extracted successively with different solvents. The extracts were subjected to preliminary phytochemical screening, which revealed the presence of alkaloids, flavonoids, carbohydrates, saponins, tannins, and steroids. The TLC and HPTLC techniques were used for qualitative determination of possible number of components in the various extracts. Solvent systems for all the extracts were optimized in order to get maximum separation on plate. Presence of various phytochemicals was confirmed by the use of different spraying reagents.

EFFECT OF MN DOPING ON THE MICROSTRUCTURE AND OPTICAL PROPERTIES OF $CU_{1-X}MN_XO$ NANOPARTICLES

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[2]*Department of Physics, Shivaji Mahavidhayalay, Renapur - 413 512, Maharashtra, India*

Abstract

The Mn doped CuO nanoparticles were synthesized by a simple coprecipitation method. Powder x-ray diffraction studied showed that all prepared samples have single monoclinic type CuO structure without any extra impurity. Significant changes occur in microstructure and optical properties of Mn doped CuO nanoparticles were investigated. Lattice parameters changes with increasing Mn doping of CuO nanoparticles. As concentration of Mn doping increases, volume of the unit cell for CuO nanoparticles were decreased. Average crystalline size (d) increases from 16 to 20 nm as the Mn increases from 0-3%. The microstrain decreased with increasing Mn content indication that the Mn sits are purely substituted by cu ions. The microstructure is investigated by field emission scanning electron microscope. UV-Vis spectroscopy is on the pure and Mn doped CuO nanoparticles revealed that the optical energy band gap decreases from 1.43-1.28eV.

Keywords: CuO Nanoparticles, microstructure properties, microstrain, optical properties.

STRUCTURAL AND OPTICAL STUDIES OF UNDOPED AND NICKEL DOPED ZnO NANOSTRUCTURE THIN FILMS PRODUCED BY SPRAY PYROLYSIS METHOD

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Abstract

This exploration deals with the effect of Nickel (Ni) doping (0%, 3%, 5%) on structural and optical properties of ZnO nanostructure thin films prepared by Spray pyrolysis technique. The recorded patterns of XRD indicate that all undoped and Nickel doped ZnO nanostructure films were hexagonal wurtzite structure with polycrystalline nature. The most intense peak is found to be oriented along (002) plane. The grain size was decreased from 20 nm to 19 nm from 0% to 5% doping of Ni. Optical studies show that optical band gap values were ranging from 3.22 eV to 3.09eV for respective Ni doping concentrations. As concentration of Ni content increased, transmittance for Ni doped ZnO nanostructure thin films decreased.

Keywords: Thin films; ZnO; nanostructure; structural properties; transmittance.

A simple, efficient and green protocol for the synthesis of quinoxalines

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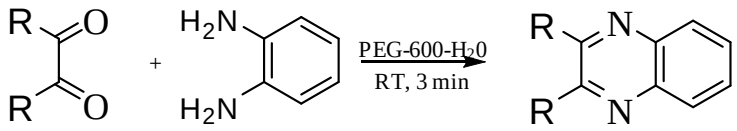
[b] Shriman Bhausaheb Zadbuke Mahavidyalaya, Barshi-413401

Abstract:

A variety of biologically important quinoxaline derivatives has been efficiently synthesized in excellent yields under extremely mild conditions using PEG-600 and water. This inexpensive, non-toxic, ecofriendly and readily available system efficiently condensed several aromatic as well as aliphatic 1,2-diketones with aromatic and aliphatic 1,2-diamines to afford the products in excellent yield. Polyethylene glycol (PEG) can be recovered and recycled.

Keywords: Polyethylene glycol (PEG), water, 1,2-dicarbonyls, 1,2-diamines, recyclability, quinoxalines.



1 **2** **3a**

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NANO-MAGNETITE SUPPORTED IONIC LIQUID PHASE CATALYST FOR SELECTIVE OXIDATION OF ALCOHOLS

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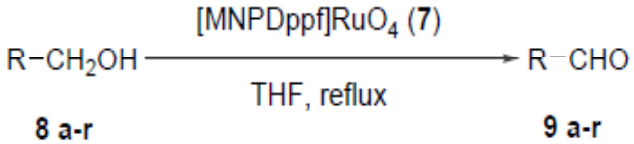
Abstract:

Oxidation reactions play a fundamental role in the chemical industries as well in academia. Oxidation is the second largest process after polymerization and contributes over 30% of total production in the chemical industry. Considering the ubiquity within the synthetic organic chemistry, ketones and aldehydes do hold the essential significance. The scrutiny of literature revealed that plethora of reports is available on selective oxidation of alcohols. However, there is still scope for improvement especially toward developing efficient protocol using highly robust heterogeneous and recyclable catalyst.

In present work, a new nano-magnetite supported ionic liquid phase (SILP) catalyst containing perruthenate anion has been prepared by multistep procedure. The formation of catalyst was confirmed by analytical techniques such as fourier transform infrared (FT-IR), X-ray photoelectron spectroscopy (XPS), transmission electron microscopy (TEM), thermogravimetric analysis (TGA), vibrating sample magnetometer analysis (VSM) and energy dispersive X-ray analysis (EDX). The SILP catalyst was successfully employed as an efficient heterogeneous catalyst for oxidation of alcohols. The catalyst could be easily separated with the aid of external magnet from reaction mixture. The heterogeneity of SILP catalyst has been confirmed by using split test and leaching studies. Additionally, the recycling studies revealed that SILP catalyst could be reused for six consecutive runs without substantial loss in catalytic activity.



THERMOLUMINESCENCE GLOW CURVE ANALYSIS OF DY^{3+} DOPED $NAALSI_2O_6$ PHOSPHOR

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Abstract.

The $NaAlSi_2O_6$ doped with Dy^{3+} as activator was prepared by the simple combustion method. Crystallinity and formation of synthesized phosphor were confirmed by XRD technique. Scanning electron microscope (SEM), FT-IR and Thermoluminescence (TL) discuss in this present work. TL characteristics show the concentration quenching observed at 1.5 mol% of Dy^{3+} ion activated $NaAlSi_2O_6$: Dy^{3+} phosphor with single TL glow peak at higher temperature. Prepared phosphor material was irradiated oxygen ion beam different flunce range from 5×10^{10} to 1×10^{14} ions/cm^2. Oxygen ion beam irradiated $NaAlSi_2O_6$: Dy^{3+}samples show the linear dose response curve in the range from 1×10^{10} to 1×10^{12} ions/cm^2. Doping effect on TL glow curve was discussed. Trapping parameter and their estimated error valves have been calculated by Chen's peak method, Initial rise method (IR) and Ilich method. Deconvolutation was applied using the peak fit method on the glow curve for optimized conditions. Chens peak method and computerized glow curve deconvolutation method was used to evaluate the trapping parameters namely, activation energy (E), frequency factor(s), kinetic order (b).

Keywords: Thermoluminescence; Oxygen ion beam; Trapping parameter; phosphor; XRD

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Photosensor studies on chemically deposited CdSe thin film

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Abstract:

Polycrystalline CdSe Semiconductor thin films were obtained by relatively simple chemical bath deposition method using cadmium sulphate (octahydrate), triethanolammine, ammonium hydroxide and sodium selenosulphate as precursor sources in an aqueous alkaline medium at 50 ± 2^0C temperature. Various preparative conditions of CdSe thin films are outlined. The grown films were found to be uniform, well adherent, and orange red in colour. The films were studied using X-ray diffraction (XRD), scanning electron microscopy (SEM), optical absorption, electrical conductivity properties and photoelectrical characterization. Phoelectrical characterization of the CdSe thin films photoelectrode was carried out by studying current-voltage in dark, capacitance-voltage in dark. Fill factor, efficiency, Isc, V_{oc}, junction ideality factor were found to be maximum. The study of power output characteristics showed open circuit voltage (V_{oc}=225 mV), short circuit current (Isc= 380 mA/cm2), fill factor (ff=41.89%), efficiency (h=1.365%).

Keywords:Thin films, Chemical synthesis, Scanning electron microscopy, Optical properties, Electrical properties, Photosensor.

Structural and optical properties of spray deposited Fe doped CdS thin films

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Abstract

The II-VI compound semiconductor thin films find wide applications in optoelectronic devices including solar cells. CdS thin films doped with Fe have been prepared by chemical spray pyrolysis technique at deposition temperature of 350 °C. The Fe doped CdS thin films are studied for structural and optical properties of by X-ray diffraction and UV-Vis spectroscopy. The XRD study indicted hexagonal wurtzite crystal structure for all films. The optical study confirmed direct band gap semiconductors. The optical band gap of 2.40 eV is observed for undoped CdS thin films. The study indicates that these films can be utilized in optoelectronic applications.

Keywords: CdS; Optical properties; Structural properties;

ECONOMIC GREEN STRATEGY FOR THE DEVELOPMENT OF ADSORBENT FOR DECONTAMINATION OF CV DYE

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Abstract

Worldwide the safe and clean drinking water is a grave haunting concerns to present generation because of the water pollution. The various anthropogenic activities from human and illegal effluents discharged from industries and society in water body creates sever threats toward water pollution. Due to some non-biodegradable nature and complex structures of the pollutants it pose great challenge and difficulties for decontamination from water bodies. With this motivation our utmost priority to address this concern. In agriculture fields disposal or degradation of agricultural remains such as cornstalk, nutshells, sugarcane leaf, rice stem, wheat stem, corncob and rapeseed oil cake pose great challenge and thus these are usually burnt off. However, the combustion products add to air pollution instead of mitigation. Herein we have developed a simple approach towards water remediation, and it follow the cleaner and greener, easy to handle, cost effective and low sludge formation for removing of toxic Crystal violet (CV) dye using adsorption techniques. We have recycled sugarcane leaves a common agriculture bio-waste by transforming it in activated carbon. In typical process, the sugarcane leaves ultrasonically treated with concentrated H_2SO_4 as impregnated reagent. Obtained material were characterization using XRD, FT-IR, SEM and BET, to support and confirm the successful preparation of the adsorbent and process. For investigating the effect of various physico-chemical parameters such as pH, amount of adsorbent, initial dye concentration, contact time, and temperature on adsorption of CV dye the batch experiments were performed. To further understand the mechanism of mass uptake by adsorbents, we apply the kinetic model as Lagergren (pseudo-first-order) and pseudo-second-order. For adsorption mechanism, various isotherm models such as Langmuir and Freundlich are being explored. The parameters obtained from the different models provide important information on the adsorption mechanisms, surface properties and affinities of the adsorbent. Further work is underway to obtain more scientific insights.

Keywords: Water pollution, Adsorption, crystal violet dye, agriculture bio-waste, Langmuir isotherm.

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doi.: 10.1080/01496395.2019.1659366.

SYNTHESIS OF IRON OXIDE NANOPARTICLES USING *PARTHENIUM HYSTEROPHORUS* AS A WEED EXTRACT AND THEIR APPLICATION

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Abstract

A simple, efficient, and ecofriendly method has been developed for the exclusive synthesis of iron oxide nanoparticles using an aqueous extract of *Parthenium hysterophorus as a* weed extract act as a reducing agent. The synthesized iron oxide nanoparticles heated in muffle furnace at 600Śc for 1hours. The synthesized nanoparticles were characterized by X –ray diffraction. This nanoparticles used for the study of Methylene blue (MB) dye removal with help of spectrophotometer. P^H and conductivity were also studied in aqueous solution iron oxide nanoparticles. The present study highlights the potential application of iron oxide nanoparticles can be explored for biomedical and technological industries.

Keywords: - Green synthesis, Iron oxide nanoparticle, Methylene blue dye,

Introduction

Iron oxide belongs to the most lavish minerals and that occurs with a large variation of structures, stoichiometries, and properties. Iron oxide exists in three forms in nature: magnetite (Fe_3O_4), maghemite (ć-Fe_2O_3), and hematite (į-Fe_2O_3). Hematite is the oldest known of the iron oxides and is widespread in rocks and soils. It is also known as ferric oxide, iron sesquioxide, red ochre, specularite, specular iron ore, kidney ore, or martite. Hematite is blood-red in color if

finely divided, and black or grey if coarsely crystalline. It is extremely stable at ambient conditions, and often is the end product of the transformation of other iron oxides. Magnetite is also known as black iron oxide, magnetic iron ore, loadstone, ferrous ferrite, or Hercules stone. It exhibits the strongest magnetism of any transition metal oxide. Maghemite occurs in soils as a weathering product of magnetite, or as a product of heating of other iron oxides. It is metastable with respect to hematite, and forms continuous solid solutions with magnetite [1]. By modifying the growth conditions, the size of the iron oxide particles can be reduced to nanosize.

Since iron oxide is a technology important material, a systematic study has been initiated to prepare it through green approach using ferric chloride as the precursor and cynodon dactylon as a weed extract act as a reducing agent. Prepared nanoparticles have been analyzed to evaluate its structural properties from X-ray diffraction studies. PH and conductivity also measured.

Experimental:-

2.1. Materials

The *Parthenium hysterophorus weed*used in this experiment was fresh and was collected from the college campus . Iron Chloride anhydraus (III) [Ferrous Chloride (98%) and $FeCl_2$(1%)]was purchased from Merk specialities PVT Mumbai India. The water used in all experiments was doubly distilled.

Preparation of *Parthenium hysterophorus weed* extract

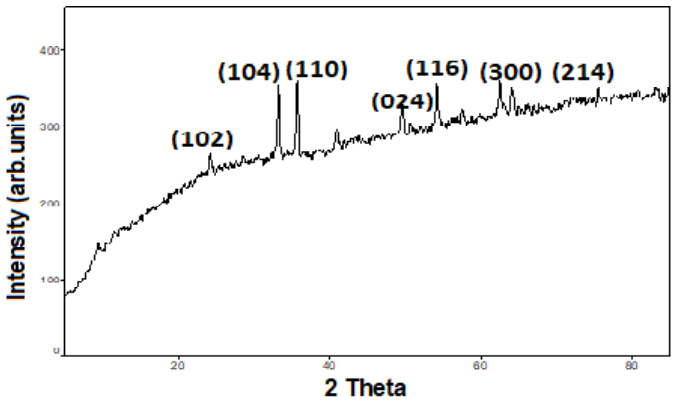
A 10.773 g of thoroughly washed *Parthenium hysterophorus leaves* was sliced finely, and crushedin mortal and pastel with help of 100 ml double distilled water for 10 min. The green extract was filtered through a filter paper. The clear filtrate was used for the synthesis of iron oxide nanoparticles for further experiments.

General procedure for the preparation of the iron oxide nanoparticles

Iron oxide nanoparticles were synthesized using sol-gel method. In sol-gel method, there are two types of materials or components, “sol” and “gel”. Sols are solid particles in a liquid subclass of colloids and gels are ligands contained in liquid. This method can produce highly pure and well controlled nanoparticle. This process involves formation of sols in a liquid and it is reduced to the desired product using a reducing agent. In the present study Iron Chloride

anhydrate is used as the precursor, Ethanol as the solvent and *Parthenium hysterophorus* extract as the reducing agent. In a typical reaction procedure, 100 ml of *Parthenium hysterophorus* extract was added to 2 g of Iron Chloride anhydraus (III) already dissolved in 100 ml ethanol, under vigorous magnetic stirring for 1 h at 80 °C. During this process, the color of the reaction solution changed from yellowish translucent to a blackish color as shown in Fig. 1, indicating the formation of iron oxide nanoparticles. The resulting product, iron nanoparticle was centrifuged and washed several times distilled water, and acetone. The Purified nanoparticle powder was dried at 100 °C for 5 h and further in muffle furnace calcinated for 600 ^{0}C for 2 h. further characterization by XRD and with help of spectrophotometer methylene blue dye removal done.

Result and Discussion



The synthesized iron oxide nanopowders were characterized using X-ray diffraction. XRD pattern indicates that the prepared iron oxide was in į-Fe_2O_3 phase exhibiting rhombohedral structure. Observed peaks are in defined positions that shows the formation of į-Fe_2O_3 without any impurity peaks of any other phase of iron oxide, which indicates a high degree of purity of the prepared samples. The broadening of the X-ray diffraction lines reflects the nanoparticle nature of the sample. In XRD, all the peaks are indexed and the d-values are compared with the JCPDS standards [JCPDS file no. 89-8104]. The crystalline size observed is 42 nm.

The concentration of MB solution before and after adsorption were estimated by measuring absorbance at 665 nm with help of spectrophotometer. 0.250 gm amount of from

waste rind of Pomegranate adsorbent was placed in 50 ml flasks containing 6.25, 5.25, 4.25, 3.25, 2.25 mg/L concentration of dye solution of corresponding pH ranging from 5.5 to 6.0.

Fig:1 Diluted absorption study of methylene blue dye

Then flasks were shaken thoroughly with hand for 5 minutes, After filtration final concentration of dye solution were analyzed by spectrophotometer. The amount of equilibrium uptake of dye is calculated by using equationqe = (C0 – Ce) V/ W

Qe- is the dye up taken by adsorbent mg/g, C_0- is the initial MB concentration, Ce- is the MB concentration (mg/l) after the batch adsorption process, W- is the Mass of adsorbent (gm), V is the Volume of dye solution

Absorbance of Pure dye	Absorbance of Iron Oxide + nanoparticle
1.74	1.70
1.69	1.63
1.63	1.30
1.54	1.01

From table shows that on dilution Abs value decreases it show that the Iron oxide nanoparticles degrades the MB dye. The interaction between dye molecule and adsorbent is basically a combined result of charges on dye molecules and adsorbent is basically a combined result of charges on dye molecules and the surface of the adsorbent.

Conclusion

The purpose of this work to use economic and environmental –friendly synthesis of nanoparticles.The weed *Parthenium hysterophorus is used as* as a new source of reducing agent.This nanoparticle is used as adsorbents for removal of methylene blue dye. In this way prepared nanoparticles can be also used for technological application.

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EFFICIENT SYNTHESIS OF ONE- POT KNOEVENGEL CONDENSATION WITH POTASSIUM CARBONATE IN PEG

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Abstract:

The Knoevengel condensation of aldehydes with active methylene compound proceeded efficiently at room temperature with potassium carbonate as a catalyst and PEG as a green solvent. C-C bonds formation reduction are important derivation in perfume, pharmaceutical, polymer applications. K**eywords:** Knoevengel condensation, Potassium Carbonate, Green Chemistry, PEG, Room Temperature.

BIG DATA

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Abstract

Big data is a new driver of the world economic and societal changes. The world's data collection is reaching a tipping point for major technological changes that can bring new ways in decision making, managing our health, cities, finance and education. While the data complexities are increasing including data's volume, variety, velocity and veracity, the real impact hinges on our ability to uncover the 'value' in the data through Big Data Analytics technologies. Big Data Analytics poses a grand challenge on the design of highly scalable algorithms and systems to integrate the data and uncover large hidden values from datasets that are diverse, complex, and of a massive scale. Potential breakthroughs include new algorithms, methodologies, systems and applications in Big Data Analytics that discover useful and hidden knowledge from the Big Data efficiently and effectively.

Keywords: Analytics technologies, algorithms, methodologies,volume, variety, velocity and veracity.

Introduction:

Big data is associated with large data sets and the size is above the flexibility of common database software tools to capture, store, handle and evaluate. Big data analysis is essential for analysts, researchers and business people to make better decisions that were previously not attained. Figure 1 explains the structure of big data which contains five dimensions namely volume, velocity, variety, value and veracity. Volume refers the size of the data which mainly shows how to handle large scalability databases and high dimensional databases and its processing needs. Velocity defines the continuous arrival of data streams from this useful information's are obtained. Furthermore big data has enhanced improved through-put, connectivity and computing speed of digital devices which has fastened the retrieval, process and production of the data. Veracity determines the quality of information from various places. Variety describes how to deliver the different types of data, for example source data includes not only structured traditional relational data but it also includes quasi-structured, semi-structured and unstructured data such as text, sensor data, audio, video, graph and many more type.

WHAT IS BIG DATA?

Definition

The term "Big Data" refers to the evolution and use of technologies that provide the right user at the right time with the right information from a mass of data that has been growing exponentially for a long time in our society. The challenge is not only to deal with rapidly increasing volumes of data but also the difficulty of managing increasingly heterogeneous formats as well as increasingly complex and interconnected data.

Being a complex polymorphic object, its definition varies according to the communities that are interested in it as a user or provider of services. Invented by the giants of the web, the Big Data presents itself as a solution designed to provide everyone a real-time access to giant databases.

Big Data is a very difficult concept to define precisely, since the very notion of big in terms of volume of data varies from one area to another. It is not defined by a set of technologies, on the contrary, it defines a category of techniques and technologies. This is an emerging field, and as we seek to learn how to implement this new paradigm and harness the value, the definition is changing.

Characteristics of Big Data

The term Big Data refers to gigantic larger datasets (volume); more diversified, including structured, semi-structured, and unstructured (variety) data, and arriving faster (velocity) than before. These are the 3V.

WHAT IS BIG DATA ANALYTICS?

Big Data generally refers to data that exceeds the typical storage, processing, and computing capacity of conventional databases and data analysis techniques. As a resource, Big Data requires tools and methods that can be applied to analyze and extract patterns from large-scale data. The analysis of structured data evolves due to the variety and velocity of the data manipulated. Therefore, it is no longer enough to analyze data and produce reports, the wide variety of data means that the systems in place must be capable of assisting in the analysis of data. The analysis consists of automatically determining, within a variety of rapidly changing data, the correlations

between the data in order to help in the exploitation of it.
Big Data Analytics refers to the process of collecting, organizing, analyzing large data sets to discover different patterns and other useful information. Big data analytics is a set of technologies and techniques that require new forms of integration to disclose large hidden values from large datasets that are different from the usual ones, more complex, and of a large enormous scale. It mainly focuses on solving new problems or old problems in better and effective ways. automatically determining, within a variety of rapidly changing data, the correlations between the data in order to help in the exploitation of it. Big Data Analytics refers to the process of collecting, organizing, analyzing large data sets to discover different patterns and other useful information. Big data analytics is a set of technologies and techniques that require new forms of integration to disclose large hidden values from large datasets that are different from the usual ones, more complex, and of a large enormous scale. It mainly focuses on solving new problems or old problems in better and effective ways.

As one of the most "hyped" terms in the market today, there is no consensus as to how to define big data. The term is often used synonymously with related concept such as Business Intelligence (BI) and data mining. It is true that all three terms is about analyzing data and in many cases advanced analytics. But big data concept is different from the two others when data volumes, number of transactions and the number of data sources are so big and complex that they require special methods and technologies in order to draw insight out of data (for instance, traditional data warehouse solutions may fall short when dealing with big data).

This also forms the basis for the most used definition of big data, the three types.

· Volume: Large amounts of data , from datasets with sizes of terabytes to zettabyte.

· Velocity: Large amounts of data from transactions with high refresh rate resulting in data streams coming at great speed and the time to act on the basis of these data streams will often be very short . There is a shift from batch processing to real time streaming.

· Variety: Data come from different data sources. For the first, data can come from both internal and external data source. More importantly, data can come in various format such as transaction

and log data from various applications , structured data as database table , semi-structured data such as XML data, unstructured data such as text, images, video streams, audio statement, and more. There is a shift from sole structured data to increasingly more unstructured data or the combination of the two

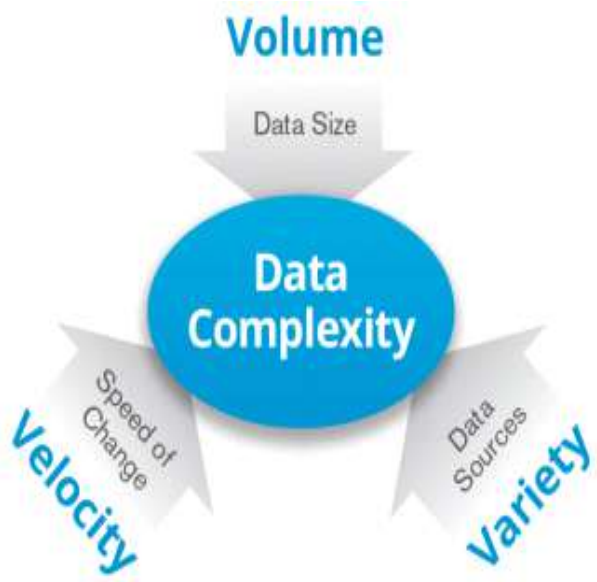

Figure 1 The three V of Big Data

Summary

· Big data is here and it is here to stay. Despite the hype, big data does offer tangible business benefit to organizations. It enables enhanced insight, decision making, and process automation.

· The characteristics of big data is the three V: Volume, Velocity and Variety. The “big” in big data is not just about volume. While big data certainly involves having a lot of data, big data does not refer to data volume alone. What it means is that you are not only getting a lot of data. It is also coming at you fast, it is coming at you in complex format, and it is coming at you from a variety of sources. · Data comes from variety of sources, and can be used in various industry applications. Often it is the combination of data sources that counts.

· Along with big data, there is also a so-called paradigm shift in terms of analytic focus. That is a shift from descriptive analytics to predictive and prescriptive analytics.

· Big data necessitates a new type of data management solution because of its highvolume, high-velocity and/or high-variety nature. This new type of data management solution bears the trademark of highly scalable, massively parallel, and cost-effective.

A. Types of Big Data Analytics

a) Descriptive Analytics

It consists of asking the question: What is happening? It is a preliminary stage of data processing that creates a set of historical data. Data mining methods organize data and help uncover patterns that offer insight. Descriptive analytics provides future probabilities and trends and gives an idea about what might happen in the future.

b) Diagnostic Analytics

It consists of asking the question: Why did it happen? Diagnostic analytics looks for the root cause of a problem. It is used to determine why something happened. This type attempts to find and understand the causes of events and behaviors.

c) Predictive Analytics

It consists of asking the question: What is likely to happen?

It uses past data in order to predict the future. It is all about forecasting. Predictive analytics uses many techniques like data mining and artificial intelligence to analyze current data and make scenarios of what might happen.

d) Prescriptive Analytics

It consists of asking the question: What should be done? It is dedicated to finding the right action to be taken. Descriptive analyticsprovides a historical data, and predictive analyticshelps forecast what might happen. Prescriptive analytics uses these parameters to find the best

solution.

IV.HADOOPFORBIGDATA

APPLICATIONS

Big Data are collections of information that would have been considered gigantic impossible to store and process, a decade ago. The processing of such large quantities of data imposes

particular methods. A classic database management system is unable to process as much information. Hadoop is an open source softwareproduct (or, more accurately, software

library framework) that is collaboratively produced and freely distributed by the Apache Foundation – effectively, it is a developer s toolkit designed to simplify the building of

Big Data solutions. Hadoopis used by companies with very large volumes of data to process. Among themare web giants such as Facebook, Twitter, LinkedIn, eBay and Amazon. Hadoop is

a distributed data processing and management system. It contains many components, including: HDFS, YARN, Map reduce. HDFS is a distributed file system that provides high-performance access to data across Hadoopclusters. MapReduce is a core component of the Apache Hadoop software framework. Hadoop enables resilient, distributed processing of massive unstructured data sets across commodity computer clusters, in which each node of the cluster includes its own storage. MapReduce serves two essential functions: It parcels out work to various nodes within the cluster or map, and it organizes and reduces the results from each node into a cohesive answer to a query. Hadoop relies on two servers: JobTracker: there is only one JobTracker per Hadoop cluster. It receives Map/Reduce tasks to run and organizes

their execution on the cluster. When you submit your code to be executed on the Hadoop cluster, it is the JobTracker s responsibility to build an execution plan. This execution

plan includes determining the nodes that contain data to operate on, arranging nodes to correspond with data, monitoring running tasks, and relaunchingtasks if they fail.

TaskTracker: several per cluster. Executes the Map/Reduce work itself (as a Map and Reduce task with the associated input data). The JobTrackerserver is in communication with HDFS; it

knows where the Map/Reduce program input data is and where the output data must be stored. It can thus optimize the distribution of tasks according to the associated data.

To run a Map/Reduce program, we must:

•Write input data in HDFS

•Submit the program to the cluster's JobTracker.

•Retrieve output data from HDFS Write input data in HDFS

•Submit the program to the cluster's JobTracker.

•Retrieve output data from HDFS.

Write input data in HDFS

•Submit the program to the cluster's JobTracker.

•Retrieve output data from HDFS.

- Write input data in HDFS
- Submit the program to the cluster Job Tracker
- Retrieve output data from HDFC

All TaskTrackers report their status continuously through heartbeat packages. If a TaskTracker fails (missing heartbeat or failed task), the JobTracker notifies the redistribution of the task to another node.

HDFS relies on two servers:

- •NameNode: unique on the cluster. It stores information about file names and their characteristics. It is the master of

the HDFS that controls slave DataNode.

- •Secondary NameNode: The Secondary NameNode monitors

- the state of the HDFS cluster and takes “snapshots” of the data contained in the NameNode. If the NameNode fails, then the Secondary NameNode can be used in place of the NameNode.
- •DataNode: multiple by cluster. Stores the contents of the

files themselves, fragmented into blocks 64KB by default

CONCLUSION

Big data refers to the set of numerical data produced by the use ofnew technologies for personal or professional purposes. Big Data analytics is the process of examining these data in order to uncover hidden patters, market trends, customer preferences and other useful information in order

to make the right decisions. Big Data Analytics is a fast growing technology. It has been adopted by the most unexpected industries and became an industry on its own. But analysis of these data in the framework of the Big Data is a process that seems sometimes quite intrusive.

Analytics is a data science. BI takes care of the decision-making part while Data Analytics is the process of asking questions. Analytics tools are used when company needs to do a forecasting and wants to know what will happen in the future, while BI tools help to transform those forecasts into common language . More often, Big Data is considered as the successor to Business Intelligence. This comparison will be discussed in a future work.

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PHYTOCHEMISTRY OF MEDICINAL PLANTS

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Abstract

Medicinal plants are rich source of bioactive phytochemicals such as antibiotic, antioxidants, anticancer, and pharmacological agents for fever, aches, infections the active phytochemicals varies with age, climate part of plant, season of collection screening method. Majority of bioactive phytochemicals deactivates during processes. Phytomedicines are rediscovered being natural, effective, sustainable activity and without side effect. Accumulation, sources of phytochemicals in medicinal plant is studied for significant extraction. The phytochemicals have been cataloged classified as per protective function, physical characteristics and chemical characteristics. NSA (Non Starch Polysacharides), Antibacterial, antifungal, antioxidants detoxifying, active were found as active bioconstituents. The phytochemical nature is found as cellulose, heemi- cellulose, alkaloids, volatile flavor compounds, biogeneic amines are important to use significantly. It significance level analysed to professional applications.

Synthesis and, Characterisation of Aggregation Induced Emission Iridium Metal Grafted on Non-Conjugated Polymer Backbone: Study of Explosive Sensing Application

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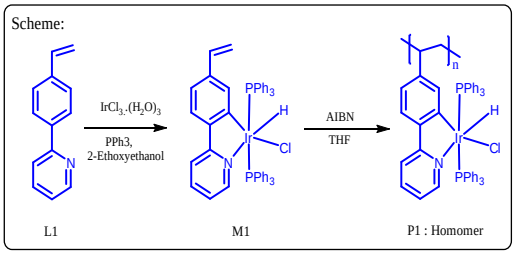
Luminophores may show reduced, unchanged, or enhanced emission, in the aggregated state as compare to their dilute solution. If luminophores experience some effects of emission quenching, partially or completely in aggregated state, it is due to the excited states of such aggregates often relax back to the ground state via non-radiative process due to intermolecular š”š stacking interactions. This phenomenon is 'Aggregation Caused Quenching' (ACQ). In 2001, Tang et al. observed fluorophores containing freely-rotating groups were non-emissive in a dilute solution but strongly emissive in the aggregated state, this observation is termed the 'Aggregation Induced Emission' (AIE).[1] Although numerous small molecules have been reported as AIEgens used in light-emitting diode (LED), chemosensors, etc. but, there is no report on heavy metal grafted on Non-conjugated AIE polymers with high quantum yield for explosive sensing application. Generally, heavy metal complex may significantly increase the efficiency of singlet-to-triplet intersystem crossing (ISC) resulting in high emission efficiency. Explosive sensing AIEgen is based on fluorescence quenching mechanism. Here, the fluorescence quenching mechanism is based on Photoinduced Electron Transfer (PET) in polymeric sensor systems.[2] This mechanism shows interactions between the polymer and explosive materials contain nitro-compounds (i.e.- Picric acid (PA), 2,4,6-Trinitrotoluene (TNT), etc.). In this work, Iridium metal grafted on non-conjugated AIE polymer has been synthesized and characterized by FTIR, NMR, and GPC, etc., which show explosive sensing application.



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SMART CAR PARKING SYSTEM USING IOT: AN APPROACH FOR SOLAPUR UNIVERSITY CAMPUS

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Abstract:

Currently, overcrowding of traffic increases with the raise in expansion of inhabitants hastily. The exploitation of individual vehicles also augmented, regarding the quantity of population. This enhances the traffic jamming on the road. The users prefer the private vehicles than public transportation. So, it is very complicated & unbearable to locate parking space in most urban areas, commercial areas, particularly during the scuttle hours. Therefore, we developed an "IOT based smart parking system" that provides information to populace for finding a parking space online. This system will be available throughout an android application to check the parking slots accessible in the parking area from everywhere around the globe. This will helps to improve a communication between smart parking system & the user. It provides an ample parking solution both for the user & owner of the parking space. It overcomes superfluous time overriding for finding the parking space in the parking areas. The present prototype model is implemented within solapur university campus user to avoid parking problem of their vehicles.

Keywords: IOT, ESP8266, IR Sensor, Blynk Platform, Android App. etc.

Computational Studies of Potentially Anti-breast cancer Enamidines

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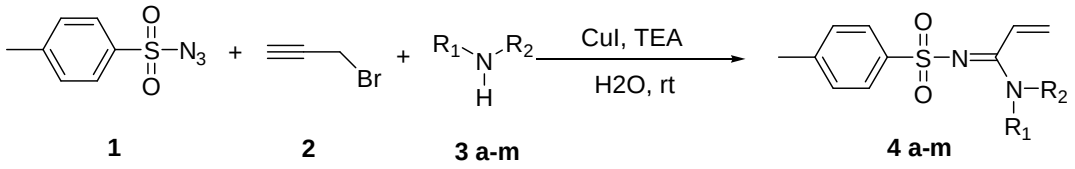
Abstract

The unprecedented Cu catalysed multi-component reaction of tosyl azide, propargyl bromide and secondary amines[1] led to the synthesis of novel series of enamidines. All the synthesized enamidines were evaluated for anticancer activities against human breast cancer cells . The four molecules **4a**, **4b**, **4c** and **4h** showed higher anticancer activity against human breast cancer cell line MCF-7 with GI_{50} values even less than standard drug doxorubicin. Furthermore, **4a**, **4b**, **4c** and **4h** exhibited good selectivity in inhibition of cancerous MCF-7 cells over normal Vero cells.[2] The molecular docking and simulation studies ascertains the mode of action of target compounds *via* inhibition of human cell division protein kinase7 (CDK7).[3-4] *In silico* ADME and bioactivity prediction studies revealed that all enamidines possess excellent pharmacological profile.

Keywords: Multicomponent reactions, Enamidines, Copper, Breast cancer, Cytotoxicity.



Scheme Multicomponent direct approach for the synthesis of enamidines

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Greener Approach towards the Facile Synthesis of 1,4-Dihydropyrano[2,3-*c*]pyrazoles by Using GELA

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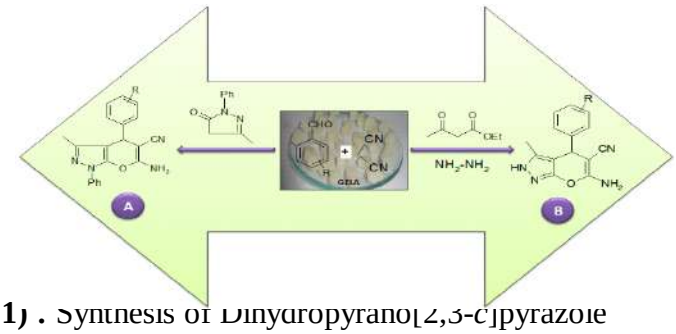
2. Email: nutanorganic@gmail.com.Tel.: 9405300057, 9881673852 "Corresponding author Tel.: +91 231 2609042; fax: +91 231 2692333.

Abstract:

Synthesis of heterocyclic compounds is potentially important due to its pharmaceutical and agricultural fields. One of the main challenges in medicinal chemistry is the design and synthesis of biologically active molecules [1]. Dihydropyrano[2,3-*c*]pyrazoles. A model reaction of benzaldehyde, malononitrile ethyl acetoacetate and hydrazine hydrate was carried out to yield corresponding product by using $ZnCl_2$-GELA and ethanol at ambient temperature with excellent yield within very short time. When the same strategy was used for the reaction between benzaldehyde, malononitrile and 3-methyl-1-phenyl-2-pyrazolin-5-one, we obtained good to excellent yield (**Scheme 1).**

The concept of Gel Entrapped Base Catalysts (GEBCs) combines the advantages of alkali and organic bases with those of heterogeneous supports. This method reduces the amount of bases used and affords easy and efficient separation of products from the catalyst.



(**Scheme 1) .** Synthesis of Dihydropyrano[2,3-c]pyrazole

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N-HETEROCYCLIC OLEFINS AS ROBUST ORGANOCATALYST FOR THE CHEMICAL CONVERSION OF CARBON DIOXIDE TO VALUE-ADDED CHEMICALS

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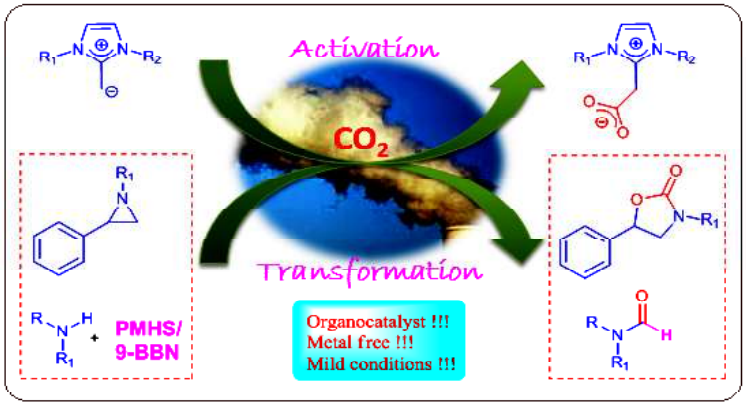
An activity of N heterocyclic olefins (NHOs) as a powerful and newly emerging class of organocatalyst is investigated for the chemical fixation of carbon dioxide through reactions with aziridines to form oxazolidinones and the N formylation of amines with polymethylhydrosiloxane (PMHS) or 9 borabicyclo[3.3.1]nonane (9 BBN) as reducing agent under mild conditions. The exocyclic carbon atoms of NHOs are highly nucleophilic owing to the electron donating ability of the two nitrogen atoms. This high nucleophilicity of the NHOs activates CO_2 molecules to form zwitterionic NHO-carboxylate (NHO-CO_2) adducts, which are active in formylation reactions as well as the carboxylation of aziridines to oxazolidinones at mild reaction conditions and provided high TON and TOF.



Scheme 1 Synthesis of value-added chemicals from carbon dioxide catalyzed by NHO ligands.

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Organosoluble, High Performance Co-poly(ether-amide)s Bearing Pendant and Cardo Moiety

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ABSTRACT:

A new diamino-diethers monomer bearing pendant methyl and cardo cyclopentylidene moiety, 1, 1-bis[4-(4-amino phenoxy)-3-methyl phenyl] cyclopentane (BAMPC) was synthesized by using simple steps. The structure of new diether-diamine monomer was confirmed by FT-IR, ^{1}H NMR, ^{13}C NMR and Mass Spectrometry. A series of new poly(ether-amide)s and co-poly(ether-amide)s were synthesized by using solution polycondensation method from diamine (BAMPC) with TPC and or IPC in various mole proportions. All synthesized polymers were characterized by FT-IR spectroscopy, solubility, inherent viscosity, thermal analysis and X-ray diffraction. Inherent viscosities of these polymers were in the range 0.81 to 0.84 dL/g indicating very good molecular weight built-up. These polymers showed excellent solubility in many polar aprotic solvents such as NMP, DMSO, DMAc, DMF etc. However these polymers were insoluble in common solvents such as THF, DCM and $CHCl_3$. X-Ray diffraction pattern of these polymers due to introduction of pendant methyl and cardo moiety with ether linkage would have disturb the chain regularity and packing, leading to amorphous nature. Thermal analysis by TGA showed excellent thermal stability of polymers. The structure-property correlation among these poly(ether-amide)s were studied, in view of these polymer's potential applications as organosoluble, high performance materials.

Keywords: 1, 1-bis[4-(4-amino phenoxy)-3-methyl phenyl] cyclopentane, Co-poly(ether-amide)s, High performance, Organosoluble.

Structural and magnetic property of $Zn_{0.5}Mn_{0.5}Fe_2O_4$ ferrite nanoparticles prepared via Sol-gel auto-combustion method

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Abstract

The structural and magnetic property of **$Zn_{0.5}Mn_{0.5}Fe_2O_4$** prepared via Sol-gel auto-combustion method is investigated. Mixed metal oxides, mixed ferrites and inverse spinels are popular in the field of photocatalysis, magnetic and optical because they exhibit significant oxidation, magnetic and optical properties compared to the bulk dimensions. The structural properties of the produced nano-particles were examined through X-ray diffraction (XRD) and infrared spectroscopy (IR). The XRD pattern revealed a single phase cubic spinel structure for the sample and the mean particle size of the nanopowders was calculated by Scherer's formula, using necessary corrections. Magnetic property was recorded using vibrating sample magnetometer (VSM). Scanning electron microscope investigations showed that the particle size distribution was homogeneous and their size was in a good agreement with those obtained by Scherer's formula. Energy dispersion X-ray analysis (EDAX) was performed to know an elemental composition of the sample and to confirm the stiochiometry. The results show that a single phase $Zn_{0.5}Mn_{0.5}Fe_2O_4$ ferrite can be obtained by sol-gel auto-combustion method at 700 ^oC with a mean particle size of below 35 nm. The present study indicated the **ferrimagnetic** character of $Zn_{0.5}Mn_{0.5}Fe_2O_4$ ferrite nanoparticles, irrespective of structural phase stability.

Keywords: $Zn_{0.5}Mn_{0.5}Fe_2O_4$ nanoparticles;; Vibrating sample magnetometer; Coercivity

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Diversity Of Spider From Drought Prone Region Sangola. Dist. Solapur (M.S.)

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Abstract

Spiders are good bio-indicators of the ecosystem health and habitat modification due to their life history traits (small body size, short generation time) and high sensitivity to habitat microclimate. They are the 7th most diverse but poorly studied group. Spiders show huge number of diversity. There are currently 43,678 described species placed in 3,898 genera and 112 families. Additionally, they also provide important ecosystem service and play important role in forest management practices. Although they are highly diverse and abundant in various natural ecosystems and play important regulating roles in ecosystem function but they have been largely ignored in biodiversity conservation .

We have conducted through field survey in 50 Spider species were recorded from all niches using five methods: pitfall trapping, sweep netting, ground hand collection, aerial hand collection and litter sampling. Specimens were identified up to genus /morphospecies level. During study, 50 species of spiders were recorded belongs to 13 families. Salticidae and Lycosidae were most abundant with 21 and 9 species, respectively . Genus *Hippasa* was found to be most diverse genera belonging to the family Lycosidae. 11 different genera consist of 35 species were identified. Spider diversity with appropriate baseline information of status, distribution and abundance of key species is crucial, for improving our understanding management, and productivity of these ecosystems.

Keywords – Arachnida, Global Biodiversity, Biological indicators, management

BLOCK CHAIN

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Abstract:

Blockchain is the backbone Technology of Digital CryptoCurrencyBitCoin. The blockchain is a distributed database of records of all transactions or digital event that have been executed and shared among participating parties. Each transaction verified by the majority of participants of the system. It contains every single record of each transaction. BitCoin is the most popular cryptocurrency an example of the blockchain. Blockchain Technology first came to light when a person or Group of individuals name 'Satoshi Nakamoto' published a white paper on "*BitCoin: A peer to peer electronic cash system*" in 2008. Blockchain Technology Records Transaction in Digital Ledger which is distributed over the Network thus making it incorruptible. Anything of value like Land Assets, Cars, etc. can be recorded on Blockchain as a Transaction.Although the blockchain may present itself as a cure-all for the IoT's security and privacy challenges, significant research efforts still need to be put forth to adapt the computation-intensive blockchain algorithms to the stringent energy and processing constraints of today's IoT devices. In this paper, we provide an overview of existing literature on the topic of blockchain for IoT, and present a roadmap of research challenges that will need to be addressed to enable the usage of blockchain technologies in the IoT.

Keywords : CryptoCurrency, BitCoin, Digital Ledger .

Development and validation of RP-HPLC method for the simultaneous estimation of Racecadotril and ofloxacin in bulk drug and marketed formulation

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Abstract:-

RP-HPLC method was developed for simultaneous estimation of Racecadotril and ofloxacin in bulk and tablet dosage form. The tablet dosage form was achieved by C8 Grace column of 4.6×250mm with particle size packing 5µm and Acetonitrile: Water (90:10v/v) pH 3 with OPA (orthophosphric acid) as mobile phase at a flow rate of 0.8ml/min. The detection was carried out at 217nm.The retention time of Racecadotril and Ofloxacin was found to be 4.10±0.5min respectively

Influence of Al doping on properties of ZnO nanoparticles synthesized by Sol-gel method

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Abstract

Nanoparticles are of current interest for optoelectronic devices. The Al doped ZnO nanoparticles are synthesized using simple and cost effective sol gel method. The calcination was carried out at temperature of 360°C for 6 hrs. The influence of Al doping on the structural, morphological and optical properties of ZnO nanoparticles has been studied. The Al doping percentage is varied from 0 to 0.5 mol% at the interval of 0.1 mol%. The X-ray diffraction study indicated polycrystalline nature of Al doped ZnO nanoparticles with Hexagonal wurtzite crystal structure. The surface morphology has been observed from scanning electron microscopy analysis. The presence of functional groups has been observed from FTIR spectra. The result indicates that the Al doped ZnO nanoparticles can be used for solar photovoltaic applications.

Keywords: Nanoparticles; ZnO; Sol-gel; X-ray Diffraction; Scanning Electron Microscopy; Fourier Transform Infrared Spectroscopy;

New Synthetic and Asymmetric Methodology

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Abstract

Research activities focus on the synthesis of biologically active compounds for the various stages of drug development. Several of our projects address the development of basic synthetic methodology, with specia lemphasis on asymmetric synthesis. Others are devoted to the synthesis of compounds of known therapeutic interest, for which the emphasis is placed on the reliability, efficiency and scalability of the processes. Synthetic chemistry methodology refers to the methods used for the synthesis of chemical compounds. Enantioselective synthesis, also called asymmetric synthesis, is a form of chemical synthesis. It is defined by IUPAC as: a chemical reaction in which one or more new elements of chirality are formed in a substrate molecule and which produces the stereoisomeric products in unequal amounts. Structural nucleus of numerous biologically active natural products, for example, iboga alkaloids such as ibogamine and catharanthine as well as non-indole-containing alkaloids such as the dioscorine and the cannivonines.

Keywords: synthetic methodology, asymmetric methodology, chemical compounds, natural product.

Structural and Optical properties of Ni doped SnO_2 thin films

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Abstract

The pure and doped Tin dioxide (SnO_2) thin films have applications in the fields of lithium ion batteries, supercapacitor, gas sensors, and photocatalysis. The Ni doped SnO_2 thin films are spray deposited at optimized substrate temperature of 475 °C and 1 M concentration of $SnCl_4 5H_2O$. The Ni doping concentration is varied from 0.0 to 10 mol%. The effect of Ni doping on structural and optical properties of SnO_2 thin films has been studied. The X-ray diffraction study indicated tetragonal rutile crystal structure of SnO_2 thin films. The peak (200) intensity decreased and peak width increased with increase in Ni doping concentration. The crystallite size increased with increase in Ni doping concentration. The optical band gap of 3.54 eV is observed for undoped SnO_2 thin films. These properties of Ni doped SnO_2 thin films indicate that they can be used in optoelectronic devices.

Keywords: Tin oxide; Optical properties; Structural properties;

Control of Mealy bug by using bio-oils as Bio-pesticides

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The mealy bugs are pinkish with a white waxy covering and hundreds are found attached to the lower nodes of plant under the leaf sheaths, barks, fruits, etc.. The mealy bugs suck the sap causing sooty mould. Severe attack results in stunted growth, yellowing of leaves, deposition of sticky honeydew, and development of sooty mould. Control of mealy bug is not easy task because they form colonies on stems and leaves developing into dense, waxy, white masses. Plant protection products are of limited effectiveness against mealy bug because of its habit of hiding in crevices, and the waxy covering of its body. Most granular insecticides are ineffective, therefore, systemic insecticides recommended to control heavy infestations. in present study, mealy bug and sap sucking insect were controlled by using some bio-oils.

Key words: Mealy bug, Plant protection, bug, insecticides.

"Assessment of Physico-chemical Parameters of Fresh Water Tank , ShindewadiNear Alegaon Sangola Dist.Solapur (M.S)"

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Abstract

People on globe are under tremendous threat due to undesired changes in the physical , chemical and biological characteristics of air , water and soil .Increased human population , industrialization , use of fertilizers and man-made activity water is highly polluted with different harmful contaminants. It is necessary to know details about different physico –chemical parameters such as temperature , hardness , pH, sulphate, chloride , DO, BOD, COD, alkalinity used for testing of water quality . Present study was carried out to assessment of physico-chemical parameters of fresh water tank . Shindewadi Tal- Sangola. Dist- Solapur (M.S)In present study the physic-chemical parameters such as PH ,Temperature, Nitrate , Potassium , DissolvedOxygen, Hardnees, Alkalinity, Chemical Oxygen Demand, Biological Oxygen Demand . we are assessed all the limit of physico -chemical *parameter are where within . the permissible limit described by WHO*

Key words: Physico-chemical parameters

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ELECTRICAL CONDUCTIVITY STUDIES OF POLYANILINE DOPED WITH 2-FUROIC ACID

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Abstract –

Doped polypyrrole samples were synthesized by in situ chemical oxidative polymerization technique with Ammonium persulfate as an oxidant and by using 2-furoic acid as dopent. Electrical conductivity of chemically synthesized polypyrrole has been studied at room temperature and normal pressure. The PANI synthesized was characterized by measurements of conductivity, FTIR, UV–VIS, XRD, SEM.

Key words: Doped polypyrrole, Conductivity, XRD, SEM.

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"COPPER OXIDE NANOPARTICLES FABRICATED BY THERMAL EVAPORATION AS POTENTIAL NO_2 SENSORS"

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Abstract:

The Copper oxide (CuO) NPs gas sensor has been synthesized on glass substrate by using thermal evaporation of the Cu powder followed by annealing in air atmosphere at 700°C temperature and further characterization with X-ray diffraction, Raman, scanning electron microscopy, atomic force microscopy and EDAX analysis for confirming its structure, morphology and composition. The chemiresistive gas sensing performance of CuO NPs were studied towards various oxidizing and reducing gases. The experimental results reveal that, CuO NPs were vastly sensitive and selective towards NO_2 gas than other test gases. CuO NPs exhibit maximum response of 28% for 100ppm NO_2 gas with very fast response time at optimal 150 °C temperature. The CuO NPs sensor manifests remarkably enhanced sensing performance, including good response and recovery time, high sensitivity, and good stability suggestive of the promising application of the CuO NPs in the gas sensing.

Keywords: CuO ; Thermal evaporation; XRD, Raman; SEM, AFM, NO_2 sensor;

"Control of Insect mosquito larvae by using Some Locally Selected Plant Extract

Shinde M. B.*; Gadekar V. S**.; Yadav . V***, Pawar S. S., Shinde S. S., Pujari R. S.

Abstract:

Mosquito are the major vector for the transmission of Malaria, Dengue fever, Filaria and other diseases. Aedes aegypti is the vector responsible for the transmission of dengue fever and it is proliferate in the stagnant water areas near the houses. To prevent mosquito borne diseases and improve public health, it is necessary to control them. Chemicals are used widely as insecticides against mosquitoes causing adverse effect on human health and the environment. There is continuous and urgent need to discover new environmentally safe biodegradable method for these vector controls. Plants may be source of alternative agents for control of vectors, because they are rich in bioactive compousnd, that are biodegradable. The present Work was aimed to find out the larvaecidal activity of some selected plants such as, Annona reticulate, Delonix regia, Eucalyptus globules and Murraya koiniggi. The extract of these plant were tested for larvaecidal activity against the Aedes aegypti.

Keywords- Plant extract, larvaecide , Mosquito, vector diseases, Aedes aegypti

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Original Research Article

Soil fertility evaluation and management from Solapur district

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ABSTRACT

The current study was carried out to assess the soil fertility evaluation with regard to traditional soil testing in the Solapur district. This study presents the soil spatial variability for soil texture, pH, EC, organic carbon, available –N, P, K, S, Zn, Cu, Mn and Fe along with multi nutrient deficiency . The information generated will be useful for managing soil resources of the Solapur district on sustainable basis. Soil test-based fertility management is an effective tool for increasing productivity of agricultural soils that have high degree of spatial variability resulting from the combined effects of physical, chemical or biological processes (Goovaerts,1998).In India, these include the prevalence of small holding systems of farming as well as lack of infrastructural facilities for extensive soil testing. Besides these crops, oilseed, pulses, fodder and vegetables etc. are grown. The increased production per unit area of these crops led to more removal of nutrients and there deficiency of nutrients. The information on micro nutrients status in district is inadequate and hence an attempt has been made for the delineation of these nutrients.

Key Words- Micronutrients, Soil fertility, Productivity, Yield, physiochemical properties.

INTRODUCTION

The challenge of crop nutrient management is to balance production and economic optimization with environmental impacts. Successful crop production is dependent upon effective nutrient management that includes identifying nutrient deficiencies and excesses. Soil sampling and soil testing provides an opportunity to check the “soil nutrient account” and is critical for developing a nutrient management plan. Knowing the nutrient requirements and nutrient removal by a crop is important for achieving a balance of nutrient inputs and crop removal outputs. Reliable nutrient recommendations are dependent upon accurate soil tests and crop nutrient

calibrations based on extensive field research. At present, the greatest challenge before Indian agriculture is to boost food production and productivity as well as sustainability of agriculture as a whole. There are problems that impose limits on these objectives or goals which raise serious concerns about national food security. These include deterioration of soil fertility, increase in cost of production, and low diversity of production systems. However, the need for improved crop productivity is more now than ever because of the increasing population and the consequent pressures from competing demands for land over time. Soil fertility is an important factor, which determines the growth of plant. Soil fertility is determined by the presence or absence of nutrients i.e. macro and micronutrients. Out of the 16 plants nutrients Boron, Copper, Iron, Manganese, Molybdenum, Zinc and Chlorine are referred as micronutrients. These elements are required in minute quantities for plant growth. The main sources of these micronutrients are parent material, sewage sludge, cow dung, farmyard manure and organic matter. These nutrients are present in small amounts in soils. The availability of micronutrients is particularly sensitive to changes in soil environment. The factors that affect the contents of such micronutrients are organic matter, soil pH, lime content, sand, silt, and clay contents revealed from different research experiments..

MATERIALS AND METHODS

The experiment was conducted rabi session of 2015-16 at the research cum Solapur soil testing laboratory in solapur Maharashtra .The soil sample collected is good representative soil samples is first criteria applied. The analytical results are expected to be representative for the entire field.

Field sampling and soil testing has become an important tool for assessing soil fertility and arriving at proper fertilizer recommendations. It's also a valuable management aid for studying soil changes resulting from cropping practices and for diagnosing specific cropping problems. Soil testing provides an index for the nutrient availability in soil and is a critical step in nutrient management planning. Soil sampling technique, timing of sampling and type of analysis need to be considered for accurate results.

This study was designed to determine the status of micronutrients in wheat growing areas of Solapur District. Represented soil samples were collected with wooden tools to avoid any contamination of the soils. Four to six pits were dug for each sample. From each pit sample

was collected at a depth 0-30 cm. A composite sample of about 1 kg was taken through mixing of represented soil sample. All composite samples were dried, ground with wooden mottle and passed through 2 mm sieve. After sieving all the samples were packed in the polythene bags for laboratory investigations. Analyzed for micronutrient (Fe, Cu, Zn, Mn and B). Standard analytical methods used in the analysis of soil samples.

Sample Preparation:- Preparing samples for laboratory analysis is just as important as collecting the soil sample. Remove half a kilogram, and air dry to stop nitrate build-up. To air dry, spread a thin layer of soil on a clean piece of paper, plastic sheets or clean shallow containers (plastic, aluminum, etc) in a clean room at room temperature. Do not dry with artificial heat. Some laboratories accept moist samples, but these must be delivered to the laboratory the same day as when they are collected. Samples can also be stored in a refrigerator for a couple of days or frozen if sample delivery is delayed. Provide complete information for each soil sample on the sheet supplied.

Laboratory Analysis-:- Research in Alberta indicates that the typical soil analyses package for surface (0-15 or 0-30 cm) agricultural soils should include soil tests for nitrogen, available phosphorus, available potassium, and extractable sulfur, plus soil pH and salinity (electrical conductivity). If possible, the nitrate and sulfur analysis should be completed for subsurface soil samples. Additional analyses for micronutrients (Boron, Chlorine, Copper, Iron, Manganese or Zinc), or organic matter for the surface soil samples may be requested. Some laboratories may provide additional analyses as part of their routine analysis package that they may use to improve interpretations and recommendations. For analysis of soil sample following method is use-

Lindsay and Norvell (1978) developed a method using DTPA (Diethylene Triamine Penta Acetic Acid) which was found useful for separating soils deficient and non-deficient categories for micronutrients and macronutrients. Ten gram of soil sample will be taken from each set in a conical flask. 20 ml of the DTPA extracting solution will be added to it. All the flasks will be corked well and placed upright on a horizontal shaker .The samples will be shaken for two hours with a speed of 120 cycles per minute. Then the suspension will be filtered through filter paper No. 42. The filtrate will be stored in a polypropylene bottle the level of micronutrients will be estimated from these extracts by Atomic Absorption Spectrophotometer.

RESULTS AND DISCUSSION

Available Soil Nutrients: To study this, there were surface soil samples collected from growing fields of Solapur . The soils were analyzed for physicochemical properties and status of available micronutrients. The results shows that majority of the soil sites were alkaline in nature with medium amount of organic matter and lime content. Considering textural classes most of the sites were sandy loam. *The soils of Solapur district are neutral to alkaline in soil reaction, safe in electrical conductivity, medium in organic carbon content and calcareous in nature* The soil p^H range from 6.88 to 8.06.The organic matter content ranged from 0.65 to 2.07 % . The lime content ranged from 1.00 to 9.37 % as reported in Table No.1.

Table-No.1: Range and average values of Physiochemical properties of tested soil Samples from district Solapur.

Sr. No	Physiochemical Properties	Range
1	Soil P^H	6.88-8.06
2	Organic Matter %	0.65-2.07
3	Lime %	1.00-9.37
4	Sand %	31.12-81.12
5	Silt %	8.56-46.00
6	Clay %	8.88-26.88

According to the concept of soil nutrient index soils are deficient in Zinc, Iron, and Boron while sufficient in Copper and Manganese content. Soil micronutrients in the study area varied with depth and elevation, though the variations were not statistically significant. The average concentrations of B, Cu, Fe, Mn, and Zn were in sufficient ranges for supporting plant growth. Soil pH increased as descending downslope from strong acidic in the high elevation to strong alkaline in the lowlands. Soil pH was shown to correlate positively with B, Fe, and Mn and negatively with Cu and Zn. Correlations among micronutrients were significant for Fe versus Mn, B versus Zn, B versus Cu, and Cu versus Zn. Comparing the extractable micronutrients (Iron, Copper, Zinc and Manganese) and hot water soluble Boron content range and average value of micronutrient in soil of the studied area are presented in Table No.2.

Nutrients	An Ideal Nutrient Condition For crop	Actual Nutrient Condition	
		Irrigated	Non-irrigated
pH	6.5- 7.8	7.6	**7.96**
Nitrogen	128	326.14	**175.62**
Phosphorus	46	47.04	**38.51**
Potassium (K)	219	680	**616**
Calcium	27	75	**35**
Magnesium	19	46	**23**
Sulphur	22	37	**15.62**
Iron (Fe)	1.8	2.74	**3.23**
Zinc	0.5	2.87	**0.45**
Manganese	0.5	4.81	**5.03**
Copper (Cu)	**0.15**	**1.87**	**2.38**

CONCLUSION

Proper nutrition is essential for satisfactory crop growth and production and use of soil tests can help to determine the status of plant available nutrients to develop fertilizer recommendations to achieve optimum crop production. The profit potential for farmers depends on producing enough crop per acre to keep production costs below the selling price. Efficient application of the correct types and amounts of fertilizers and manure for the supply of the nutrients is an important part of achieving profitable yields and minimizing environmental impacts. Deficiency of micronutrients in soil may cause decline in crop yields and total productivity in future. As par the nutrient index value, soil factors such as pH, EC, OC and $CaCO_3$ were contributed lower fertility status in relation to availability of micronutrients. Strategies involving the soil application of micronutrients by seed treatment, foliar sprays or

use of organic manures can adopt to sustain an optimum yield of crop.

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Synthesis and Characterization of Polyamides from N, N' bis-(4'-aminobenzoyl) benzene1,4-diamine by Yamazaki's Phosphorylation Method

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ABSTRACT:-

An aromatic diamine, N,N' bis-(4'-aminobenzoyl) benzene1,4-diamine containing amide group was synthesized and characterized by FT-IR, NMR (^{1}H, ^{13}C, DEPT ^{13}C) and Mass spectrometry. A series of novel aromatic polyamides was synthesized from diamine and various aromatic and aliphatic diacids using Yamazaki's Phosphorylation mehod. All the polyamides were obtained in very good yields and were characterized by FT-IR spectroscopy, viscosity measurements, solubility tests, differential scanning calorimetry (DSC), thermogravimeric analysis (TGA) and X-ray diffraction (XRD) techniques. The inherent viscosities (η_{inh}) of these polyamides were in the range 0.24 to 0.46 dL/g in DMAc at 30 ± 0.1 °C; indicating moderate to high molecular weight buildup. The polyamides showed solubility in aprotic polar solvents such as N-methyl-2-pyrrolidone (NMP), N, N-dimethylacetamide (DMAc), dimethyl sulphoxide (DMSO), N,N-dimethylformamide (DMF), pyridine m-Cresol and Conc.H_2SO_4. The XRD results showed that the polyamides were partly crystalline. The glass transition temperature (T_g) of these polyamides were in the range 262 to 277°C. The thermogravimeric analysis of all polymers showed no weight loss below 280°C whereas the char yields at 800°C were in the range 17 to 46 % indicating high thermal stabilities of these polymers. Thus these polymers meet high temperature resistant requirements and could find applications as special materials in aerospace, military and microelectronics industries. The structure–property correlation among these polyamides is discussed.

Keywords: N, N'bis-(4'-aminobenzoyl) benzene1, 4-diamine, inherent viscosity, XRD, thermal stability.

1. INTRODUCTION:

In most of the fields, aromatic polyamides have attracted much attention of researchers all over the world as a class of high temperature resistant polymers. Hence efforts were devoted

to the synthesis of new, thermally stable polymers. But aromatic polyamides have the poor processability due to their limited solubility in common organic solvents and extremely high glass transition or melt temperature. Therefore, many efforts have been made to design the chemical structures with amide linkage and kinked structure to obtain aramides with improved processability [1-4]. Here we report synthesis and characterization of new aromatic diamine; N,N'bis-(4'-aminobenzoyl) benzene1,4-diamine and novel polyamides therefrom. To increase their thermal stability and solubility in common organic solvents various functional groups have been introduced into their backbones, through further copolymerization. [5-6]

2. EXPERIMENTAL

N-Methyl-2-pyrrolidone (NMP), N, N-dimethyl acetamide (DMAc) were purified by distillation under reduced pressure over calcium hydride and stored over molecular sieves 4 Å. Pyridine was refluxed over potassium hydroxide pellets under nitrogen, distilled and stored over 4 Å molecular sieves. Diacids were purified by reported procedure. 1, 3-diaminobenzene and 4-nitro benzoic acid E.Merk products were recrystallized from alcohol and vacuum dried. LiCl was dried under vacuum at 15 °C for 6 hours. Triphenyl phosphite (Aldrich) was used as received.

2.1 SYNTHESIS OF N, N' BIS-(4'-NITROBENZOYL) BENZENE 1, 4-DIAMINE (I)

A 250 mL three necked round bottom flask equipped with a water condenser, a calcium chloride guard tube, a magnetic stirrer, a nitrogen gas inlet and a thermowell was flame dried under flow of nitrogen gas. N-Methyl-2-pyrrolidone (NMP) 50 mL, pyridine 25 mL, benzene 1, 4-diamine (PPDA) 10 g (0.05mol) and 4-nitrobenzoic acid 16.7 g (0.1mol) were charged into the flask. Triphenyl phosphite (TPP) 31.26 mL (0.12mol) was added and the reaction mixture was heated to 110°C under stirring, for 12 h. The reaction mixture was then cooled and poured into excess methanol, to precipitate the N, N'bis-(4'-nitrobenzoyl) benzene1,3-diamine which was filtered on Buckner funnel, washed with hot water and then with methanol (3 x 100 mL) and was dried under vacuum at 80°C.

Yield: 23 g (90%), M.P.: 187^{0}C

2.2 SYNTHESIS OF N, N' BIS-(4'-AMINOBENZOYL) BENZENE 1, 4-DIAMINE (II)

Into a 250 mL three necked round bottom flask N, N'bis-(4'-nitrobenzoyl) benzene1, 4-diamine (0.020mol, 8.12 g) and 10 % Pd/C (0.4 g) were suspended in 200 mL ethanol. The suspension solution was heated to reflux and 99 % hydrazine monohydrate (20 mL) was added dropwise over 1 h. After additional 8 h of refluxing, the resultant clear, dark solution was filtered

while hot to remove catalyst, and the filtrate was subjected to distillation to remove part of solvent. The concentrated solution was poured into 150 mL water with stirring, giving rise to an off white BABD (II), which was filtered, washed with water till free from hydrazine hydrate. The BABD (II) was recrystallized from aqueous ethanol and vacuum dried.

Yield: 6.5 g (93%); M.P.169°C.

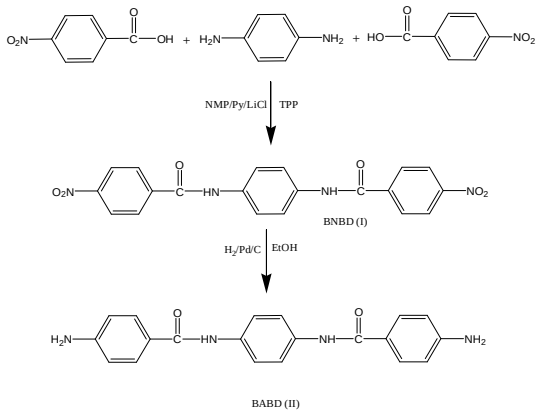
2.3 POLYMER SYNTHESIS: (PA-1)

In a 100 mL three neck round bottom flask equipped with reflux condenser, magnetic stirrer, calcium chloride guard tube and nitrogen gas inlet were placed BABD (II), 0.346 g (1 mmol), 0.166 g (1 mmol) isophthalic acid, 0.200 g lithium chloride [8 wt % based on solvent N-methyl pyrrolidone (NMP) and pyridine mixture] and 0.744 g (0.63 mL, 2.4 mmol) triphenyl phosphite (TPP), 0.5 mL pyridine and 2 mL NMP. The mixture was stirred well and temperature was slowly raised to 100 °C over a period of 30 min and the mixture maintained at 100 °C for 3 h. After cooling the resultant viscous solution was poured into rapidly stirred 200 mL methanol. The precipitated polymer (PA-1) was filtered, washed with methanol and dried under vacuum at 100 °C for 8h. Yield 0.467 g (98%); η_{inh} 0.24 dL/g

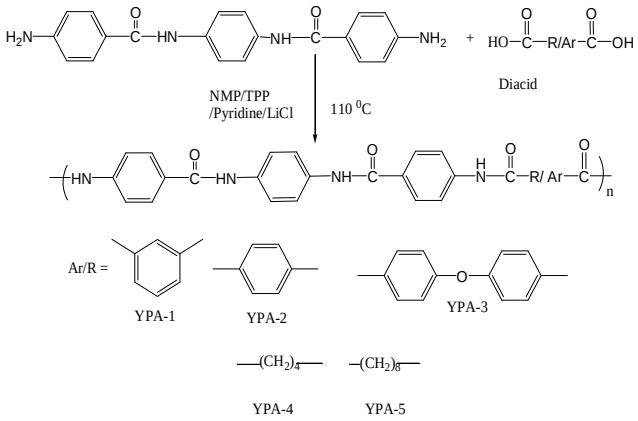
Similarly other polyamides, PA-2 to PA-5 were synthesized by utilizing above procedure with different aromatic/aliphatic diacids. (Scheme-2)

The yields and viscosities of all polyamides are summarized in Table-1. All the polymers were obtained in almost quantitative yields (more than 95 %). The inherent viscosities were in the range of 0.24 to 0.46 dL/g in DMAc indicating moderate to high molecular weight build up.

Scheme: I: Synthesis of N, N' bis-(4'-aminobenzoyl) benzene1, 4- diamine (II)



Scheme: II: Synthesis of Polyamides from BABD and various diacids by Yamazaki's Phosphorylation method



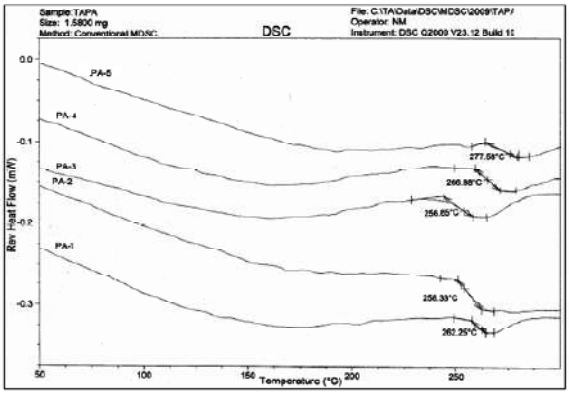


Fig.1 DSC Curves of PA-1 to PA-5

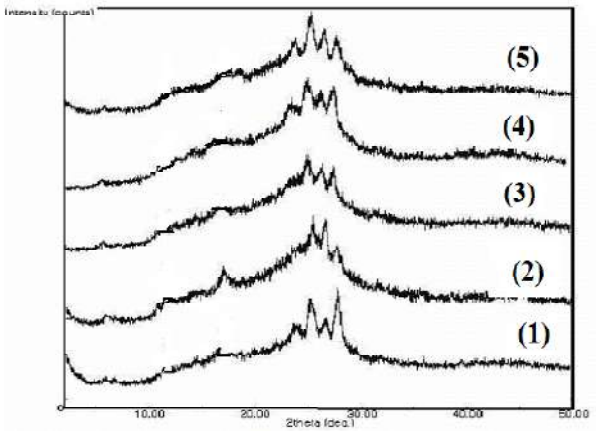


Fig.2 XRD Curves of PA-1 to PA-5

Table-1: % Yield and inherent viscosity of polyamides[a] PA-1 to PA-5 from BABD and different diacids by Yamazaki's phosphorylation method

Polymer code		Diacids	Yield(%)	Inherent Viscosity(dL/g)[b]
PA-1	Adipic acid	98		0.24
PA-2	Sebasic acid	95		0.28
PA-3	Isophthalic acid	96		0.30
PA-4	Terephthalic acid	95		0.32
PA-5	4, 4' Oxy bis (benzoic acid)	96		0.46

[a]Polymerization was carried out with 1mmol each of BABD and diacid(s).

[b]Measured at concentration of 0.5 g/dL in DMAc at 30°C.

Table-2: Thermal properties of polyamides[a] PA-1to PA-5

Sr. No.	Polymer Code	[b]Ti (°C)	[c]Tmax (°C)	Residual wt. at 800 °C (%)	T_g[d] (°C)
1	PA-1	280	401	17	262
2	PA-2	284	412	20	258
3	PA-3	294	417	28	256
4	PA-4	302	450	32	266
5	PA-5	307	530	46	277

[a]Thermo gravimetric analysis was conducted at a heating rate of 10 °C/min under Nitrogen.

[b]Ti, temperature at which initial loss of mass was observed.

[c]T_{max}, temperature of the maximum rate of decomposition from derivative T_g.

[d]Determined by DSC measured at a heating rate 20 °C/min.

Table-.3: Solubility[b] of polyamides[a] YPA-1 to YPA-6 from BABD[c] and various diacids by Yamazaki's phosphorylation method

SOLVENT	PA-1	PA-2	PA-3	PA-4	PA-5
DMAc	++	++	++	++	++
NMP	++	++	++	++	++
DMSO	++	++	++	++	++
DMF	++	++	++	++	++
m-Cresol	++	++	++	++	++
Pyridine	++	++	++	++	++
Conc. H_2SO_4	++	++	++	++	++

++ = Soluble at room temp +- = partly soluble

[a] Polymerization was carried out with 1mmol each of BABD (II) and [IPC/TPC]

[b] Measured at concentration of 0.5 g/dL in DMAc at 30°C.

[c] BABD (II), N,N'bis-(4'-aminobenzoyl) benzene 1,4-diamine

3. RESULTS AND DISCUSSION:

Aromatic polyamides have commercial utility, because fibers and films of these polymers not only possess excellent physical properties at room temperature but retain their strength and excellent response to work loading at elevated temperatures for prolonged period of time. Most of these polyamides are derived from aromatic diamines by polycondensation technique.

The structure of monomer was confirmed by IR, NMR (^1H and ^{13}C) and mass spectrometry. The dinitro compound BNBD (I) showed IR band at 1345 cm^{-1} due to $–NO_2$ group while diamine compound BABD (II) showed band at 3413 and 3320 cm^{-1} due to $–NH_2$ group which indicates the total conversion of nitro group into amino group. The PMR spectrum showed a peak at 3.63 δ corresponding to $-NH_2$ group. All the polymers were characterised by viscosity measurements, solubility, IR, TGA, DSC and XRD techniques. Elemental analysis of BABD (II) for C, H and N % was in good agreement with those calculated.

Aromatic polyamides were synthesized by Yamazaki's Direct Phosphorylation of BABD (II) with various aromatic and aliphatic diacids **(Scheme: 2)**.

The results of synthesis of polyamides are presented in **Table 1.** All the polymers were obtained in more than 95 % yields. These polyamides exhibited inherent viscosities in the range 0.24 to 0.46 dL/g showing that the resultant polymers were of moderate molecular weights. Inherent viscosity of polyamide PA-5 based on 4, 4' Oxy bis (benzoic acid) was highest (0.46 dL/g) among the series. This was attributed to the higher reactivity and molecular weight of diacid compared to other diacids.

The inherent viscosities (η_{inh}) of these polyamides were in the range 0.24-0.46 dL/g in DMAc at 30 ± 0.1°C; indicating moderate to high molecular weight build up. The polyamides showed solubility in aprotic polar solvents such as N-methyl-2-pyrrolidone (NMP), N, N-dimethylacetamide (DMAc), dimethyl sulphoxide (DMSO) and N, N-dimethylformamide (DMF), Pyridine and Conc.H_2SO_4.

Thermal properties of polymers were evaluated by DSC and TGA and the data on these polyamides is listed in **Table-2**. The X-ray diffraction pattern of all polymers exhibited partly crystalline nature of these materials **(Fig.1)**

4. CONCLUSIONS:

Synthesis of a new diamine containing amide unit, namely N,N'bis-(4'-aminobenzoyl) benzene1,4-diamine BABD (II) was successfully accomplished and it was characterized by IR, NMR and mass spectrometric techniques. A series of polyamides was synthesized by copolymerization of the BABD (II) and various aromatic and aliphatic diacids. Viscosity values of these polymers were in the range of 0.24 to 0.46 dL/g indicating built up of moderate molecular weights. The solubility of polymers was tested in different solvents. The T_g of polymers were in the range of 190 to 225°C. Thermal stability of polyamides was evaluated by TGA under nitrogen atmosphere and all the polymers showed no weight loss below 280 °C; indicating good thermal stability. The X-ray diffraction pattern of all polymers exhibited partly crystalline nature of these materials.

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SELF ASSEMBLED SHORT PEPTIDE AMPHIPHILE (SPA) AND ITS ANTIMICROBIAL ACTIVITY

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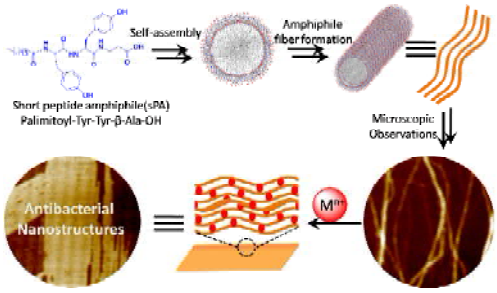
Abstract:

Lipopeptides comprising a long aliphatic domain with an elementary host defense peptides (eHDP) are greatly expressed by microbial membranes hence may render them cytotoxic. The cytotoxicity of such peptides is owing to their amphipathic nature which leads to the formation of self assembled intricate fibrous networks i.e. carpets, micelles of high aspect-ratio and aggregates in the solution. Such class of peptides are enriched with the crucial factors viz; hydrophobicity, hydropathy and electrostatic interactions, which are responsible for membrane binding. We have developed facile and improved antimicrobial nanostructures by using Palmitoyl-Try-Try-β-Ala, a short peptide amphiphile (sPA) and conjugated it with bioactive transition metal ions.



We found that the designed sPA was greatly expressed by bacteria and therefore worked as metal ions delivery agent. The bacterial test demonstrated that the bioactive metal ions conjugated sPA hybrid nanostructures were effective against Gram-positive *Streptomyces species*, *Staphylococcus aureus* and *Escherichia coli*.

Scheme:- Showing formation of carpet or sheet like structures which can be used as toxic metal ion delivery agent(s)[6]

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DIVERSITY OF FLESHY MUSHROOM IN DRY DECIDOUS FOREST IN SANGALI DISTRICT, MAHARASHTRA. (INDIA)

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ABSTRACT : During the floristic study of the mushroom of this region author come across a number of mushroom species . In this study five species of mushroom are being discussed. 1. *Marasmius conigenus*, 2. *Inocybe corydalina* Quelet, 3. *Polyporus perennis* (L.) Fr., 4. *Panaeolus papilionaceous* (Fries) Quelet and 5. *Coprinus niveus* (Pers. Fr.)Fr., are being discussed with different five genus and species. All the different genus and species are being reported for the first time from this region .

KEY WORDS : Mushroom.

INTRODUCTION :

The soil is one of the most important and interesting factor and is the most characteristics feature of terrestrial environment in which study of soil increase knowledge and helpful in practice of Agriculture , Horticulture and Forestry. The soil is the earthy material in which plants grow. The science deals with study soil is called as soil science. The soil is thin covering over the land consisting of mixture of minerals, organic materials, living organisms, air and water that together support the growth of plant life. Soil is the mixture weathered rock material and organic detritus both of which are formed through the physical, chemical and biological processes occurring slowly and slowly for a long periods at earth surface .

On the soil consists number of micro organisms like bacteria, viruses, fungus, protozoa and algae nutrients released in detritus are decomposed by various soil microbes like bacteria, algae, fungi and protozoa etc. bound in or on soil particles and taken back into plants through their root system. Soil (mud) also main source of nutrients for all aquatic plants. In addition soil is the means of support for all terrestrial organisms. Fungi plays very important role in decay and decomposition of plants and animal particles and also decomposed dead bodies of plants, animals and their waste.

Our paper focuses on the macromycetes fungi. This large group includes a majority of the species of the class basidiomycetes. Macromycetes constitute a large part of Sangali fungal reserve and are important components of its natural ecosystem. They create a secondary product beneficial to both animals and people in the form of fruiting bodies the yields of which the forests may reach over a ton of fresh weight per hectare. Macromycetes or mushrooms tremendously valuable food products. Mushroom is technically confined to members of a fungi with gills of thousands of species of mushrooms know throughout the world. A few species produce death or serious illness when eaten.

The number of poisonous fungus species is probably more than 200 many mushrooms formerly considered doubtful or poisonous have been found to be edible. Fungal species are especially important components of biodiversity in tropical forest. Mushrooms are unique they are neither animal or plant. Some people consider them plants for various reasons but they differ from plants in plants in that they lack the green chlorophyll that plants use to manufacture their own food and energy for this reason they are placed in a kingdom of their own the kingdom of fungi. The above described mushrooms are called saprophytic fungi due to their feeding habits.

Fungi are beneficial organisms we have derived number of useful antibiotics from them, including the wonder drugs penicillin. Fungi are play important role in industrial fermentation they contains various types of enzymes ,vitamins, folic acid and vitamin B-12 absents in other foods are present in mushrooms. Due to low starch /sugar content mushrooms are ideal food for diabetic patient. Fat content of mushroom is rich in linoleic acid an essential fatty acid since they do not produce cholesterol there are good for heart patients. Due to their alkalines ash high potassium, sodium ratio and high fiber content mushroom are ideal food for those sufferings.

Organic acid fungi are cause pathogen and fungi perform great role in medicine as a source antibiotic. This paper introduced from sangli district of three different region that have been grown naturally on various types of natural biological media. Terrestrial mushroom are included. Many workers reported fungi from decaying log, humus, dung, rhizosphere(Alexopoulos and Mims 1979, Alexopoulos 1962, Lincoff G. and Mitchel D.H. 1977,Lincoff Garry H. 1981, Ainsworth G.G.,Sparrow F.K.and Sussman 1973, Miller O.K.1975,1977, Smith A.H. 1947,1968, 1971,1973, 1979, Snail 1970,1971 Peter Jordan1995,1996 and 2000, Augusto Rinaldi Vassali Tyndalo 1985, Jacob E.Lange and Morten Lange 1961).

MATERIAL AND METHOD :

All the sample were collected from different areas of Sangli district . The three region were taken into consideration. These were Sagareshwar from kadegaon taluka , Vita ghat from Vita taluka and Sukarachri from Atapadi taluka. From each three region sample were collected from different localities. Total 48 fleshy mushroom sample were collected.

All the fleshy mushroom sample were grow on natural media .The source of natural media on which fleshy mushroom grown are humus, deadwood debris, decaying logs, wood decomposing fungi ,dung ,dying tree roots, roots of living plants, exterior and interior humus contain soil, lawn and garden , health forest and landscape , dead plant material , living plant material, bark of trees , living and non-living host of plants biomass ,topsoil.

All the fleshy mushroom collected from wild area of Vita, Sagareshwar and Sukarachari during month of September 2007 from the different localities and material deposited in the formalin and photographs it, listed it according to index of preservation and studied. Identification of all mushroom is carried out with the help of movable suiting, stopper photographs , preserve material and following mushroom to taking a refrecnes of Simon and Schusters Guide to mushroom by Giovanni Pacioni, U.S. editor: Gary Lincoff., The mushroom guide and identifier by Peter Jordan, Augusto Rinaldi, Vassili Tyndalo-The complete book of mushrooms,Mushroom of the great lakes region by Verne ovid Graham, Collins Guide to mushrooms and Toadstools by morten lange and F.Bayard Hora. This is the important method are use for the identification of fleshy mushroom.

RESULT AND DISCUSSIONS:

1. *Marasmius conigenus*

COLLECTION EXAMINED：RRT/121, Sept.-2007, Vita, Dist.-Sangli. On decaying wood.

DISTIRBUTION : INDIA： M. S. (Tem, 2007), India, Central America and South Africa.

Cap blackish brown, rounded, smooth, slightly hard, arise in cluster, near about 1-3 cm; Stipe 2-3 cm long, thin, cylindrical, brown in color, velvety, flesh tough, solid, hard, outer smooth; Gills are arise at

lower side of the pileus, smooth, many, bears a spores, brown in color; Rainy season on wood; Spores are brown in color, 5-6 microns, spherical in shape.

2. *Inocybe corydalina* Quelet

COLLECTIION EXAMINED：RRT/122, Sept.-2007, Vita, Dist.-Sangli, On moist grassy soil.

DISTRIBUTION : INDIA：M. S. (Tem, 2007), Europe and the British Isles.

Cap roundish sometime irregular in shape, dome shape, smooth, brownish white in color, 3-6 cm, then hazel, squamose sometimes, slightly greenish umbo; Stipe long, solid, white tint reddish in color when expose in air, cylindrical, broad at the base, narrow at the apex, thick, 4-5 cm long; Spores are globose, brown in color 3-5 micron; season rainy on moist soil, poisonous.

3. *Polyporus perennis* (L.) Fr.

COLLECTION EXAMINED：RRT/123, Sept.-2007, Vita, Dist.-Sangli. On moist soil.

DISTIRBUTION : INDIA： M. S. (Tem, 2007), Britain, Ireland, Europe and North America.

Cap plate like, flat, hard, woody, shallow, thin flesh, 2.9-7 cm in diameter, wavy, irregular at maturity, velvety upper surface, smooth, reddish brown or yellwish, rusty or brown with radial striae and darker concentric circles, glabrous, margins are arise at upper surface of pileus, lower surface cover grayish brown pores, fan shape; Stipe thick, long, cylindrical, smooth, reddish brown or dark brown, velvety then rusty and glabrous, fibrous, solid, hard, woody, 2-4.9 cm long, swollen at the base and narrow at the apex, stuffed, flesh thin, tough, odor or not distinctive and flavor soft; Pores small, round then angular, uneven, first pruinose and whitish then grayish brown in color; Tubules short, decurrent, grayish brown; Spores are golden brown or yellowish, clusters, joined with cap, viable several years, globose or broadly ellipsoidal, smooth, 5-6.9 x 3.6-4 microns; rainy season, on soid and wood, not edible.

4. *Panaeolus papilionaceous* (Fries) Quelet

COLLECTION EXAMINED：RRT /124, Sept.–2007, Vita, Dist.-Sangli. On moist soil.

DISTRIBUTION : INDIA：M. S. (Tem. 2007), North America, Canada, South Africa and US.

Cap hemispheric or campanulate, slightly more open, first brownish pink or grayish brown, then dry, lucid, white tinged with pink, but still brownish at the centre, where it easily crack, margin extending over the gills, near about, 2-5 cm across; Stipe long, thin, cylindrical, stiff, smooth, gray-brown, fibrous, solid or hallow, flexible, bent, 6-12 cm in length; Flesh thin, odor and flavor mild; Gills are attached to the stem, broad, yellowish brown then olivaceous, adnate to close crowded; Spores are 6.9-10 micron; Non edible, rainy season on moist soil.

5. *Coprinus niveus (Pers: Fr.)Fr.*

COLLECTION EXAMINED : RRT/125, Sept.–2007, Vita, Dist.-Sangli. On moist soil.

DISTRIBUTION : INDIA : M. S. (Tem. 2007), Europ, North and Central America.

Cap 1.5–3cm high, ovoid to conical at first, bell-shaped when expanded with split or rolled-back margin, white covered in chalk-white meal or ash, whitish pink in color. Stipe 4–5 cm, white pink, slightly thickened at the cottony base, cylindrical, smooth, solid, flexible. Smell none. Gills white or brwon, rapidly greying and finally black. Spore print black. Spores ellipsoid or slightly almond-shaped, 15–19 x 11–13um. Mealy covering of cap consisting of thin-walled, smooth globose calls. Habitat on cow or horse dung, soil. Season rainy, summer to autumn. Occasional. Edibility unknown -avoid.

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4. *Panaeolus papilionaceous*

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N-Heterocyclic Olefins as Robust Organocatalyst for the Chemical Conversion of Carbon Dioxide to Value-Added Chemicals

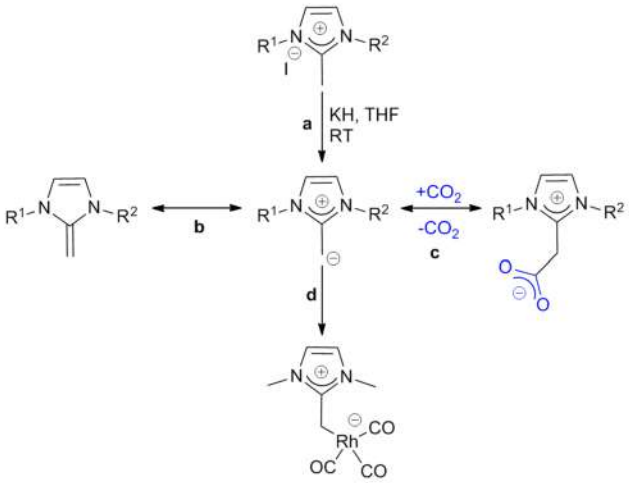
Vitthal B. Saptal and Bhalchandra M. Bhanage*[a]

In this report, the activity of N-heterocyclic olefins (NHOs) as a newly emerging class of organocatalyst is investigated for the chemical fixation of carbon dioxide through reactions with aziridines to form oxazolidinones and the *N*-formylation of amines with polymethylhydrosiloxane (PMHS) or 9-borabicyclo[3.3.1]nonane (9-BBN) as the reducing agent under mild conditions. The exocyclic carbon atoms of NHOs are highly nucleophilic owing to the electron-donating ability of the two nitrogen atoms. This high nucleophilicity of the NHOs activates CO_2 molecules to form zwitterionic NHO–carboxylate (NHO–CO_2) adducts, which are active in formylation reactions as well as the carboxylation of aziridines to oxazolidinones.

Introduction

N-Heterocyclic olefins (NHOs) represent a special new class of organic ligand with strong donor characteristics. The NHOs were first reported by Kuhn and co-workers in the 1990s.[1a] These NHOs represent the cyclic derivatives of ketene aminals (ene-1,1-diamines) and as a kind of ylidic olefin are extremely polarized alkenes.[1] Owing to their inherent structural characteristics, NHOs have received much attention recently. The exocyclic carbon atoms of NHOs bear an extensive amount of electron density, and the charge separation can be shown by the resonance structure in Scheme 1 b. The five-membered unsaturated aromatic heterocyclic rings stabilize or effectively capture the positive charge and maximize the electron density at the terminal carbon atom of the olefins (exocyclic carbon atom).

Owing to their remarkable structures, NHOs were considered as highly powerful nucleophiles and strong donor ligands comparable to N-heterocyclic carbenes (NHCs).[2] The structures of NHOs closely resemble deoxy-Breslow intermediates, which are projected to play a major role in NHC-based organocatalysis.[2l] This extraordinary feature provides NHOs with remarkable properties, a few of which have been utilized for the synthesis of NHO–metal complexes,[3] the synthesis of NHO–CO_2 adducts,[4,5] or in Diels–Alder reactions.[6] Amazingly, Fürstner et al. reported a very simple NHO complex also possesses more electron density at the metal center than typical NHC complexes.[7] Recently, Rivard et al. demonstrated that NHOs act as strong nucleophiles to stabilize GeH_2 and SnH_2 complexes.[8] Mayr and co-workers demonstrated the olefinic carbon atoms of NHOs are highly nucleophilic and have a tendency to attack benzhydrylium ions to yield azolium salts.[9] Ghadwal et al. reported NHO-stabilized mono- and dicationic hydridoboron compounds.[10] Tamm et al. demonstrated the treatment of NHOs with $B(C_6F_5)_3$ to afford classical or abnormal Lewis acid/base adducts.[11] The combination of NHO ligands with metals resulted in superior activity in polymerization reactions.[12] Dove and co-workers utilized NHOs as highly potent organocatalysts for the polymerization of epoxides and synthesized poly(propylene oxide) with a high turnover number (TON).[12b] In addition, NHOs can react with kinetically stable CO_2 to afford stable zwitterionic NHO–CO_2 adducts (Scheme 1 c). These NHO–CO_2 adducts show potential for CO_2 capture and can quench reactions for the synthesis of carbonates.[4,5] The cycloaddition reactions of CO_2 with epoxides to synthesis cyclic carbonates with NHOs as the catalysts were also established by Lu and co-workers.[5a] Very recently, Chen et al. reported carbodicarbenes (CDCs) or bent allenes analogous to NHOs as organocatalysts



Scheme 1. (a) Typical procedure for NHO synthesis, (b) mesomeric structure of NHO, (c) structure of NHO–CO_2 adduct, and (d) NHO rhodium complex reported by Fürstner.[7]

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for the reductive N-methylation of amines with CO_2 and borane.[5c] Like NHOs, other strong Lewis bases, such as N-heterocyclic carbenes,[5d] phosphorus ylides,[5e] and alkoxide-functionalized imidazolium betaines,[5f] also form CO_2 adducts readily, and these adducts show high activity in the catalytic transformation of CO_2.

Carbon dioxide contributes approximately 82% of total greenhouse gases (GHGs), which are considered as the main cause for global warming, and the climate change caused by global warming is becoming one of the significant threats to civilization in modern times.[13] Carbon dioxide contains carbon in its highest oxidation state and is kinetically and thermodynamically stable in nature. On the other hand, the chemical fixation of CO_2 into valuable chemicals is considered as a cutting-edge sustainable-chemistry technology as CO_2 is abundant, cheap, and renewable and the process is environmentally friendly.[14] The products derived from CO_2 fixation provide very important scaffolds for academic and industrial chemistry such as methanol, formic acid, cyclic and acyclic carbonates, polycarbonates, polyurethanes, and urea.[14] In some cases, CO_2 can be used as a soft oxidant and promoter in catalysis.[14j] Carbon capture and utilization (CCU) is also a hot research topic.[14k]

The cycloaddition reaction of CO_2 with aziridines is the most important and promising route for the transformation of CO_2 into oxazolidinones through the formation of C–N and C–O bonds, and this reaction is clean and atom-economical. The oxazolidinones are the most important heterocyclic ring system and are used widely in chiral auxiliaries, antibacterial drugs, and fine chemicals and as intermediates in pharmaceuticals.[15] For the synthesis of oxazolidinones from CO_2 and aziridines, various homogeneous and heterogeneous catalytic systems have been reported.[16] NHC-based catalysts are also highly active for this reaction.[16b,c] Nevertheless, this reaction still has disadvantages such as the use of solvents, metals, additives, high temperature, or high pressure. Hence, there is an instant need to develop an efficient catalytic protocol that operates under mild reaction conditions. The NHO–CO_2 adducts formed from NHOs and CO_2 are efficient CO_2 carriers for CO_2 fixation through the nucleophilic addition of the CO_2 unit to various products.[5] This reactivity of NHOs towards CO_2 encouraged us to apply the CO_2 fixation protocol to the synthesis of oxazolidinones.

Herein, we report the synthesis of various NHOs as organocatalysts and their use for the chemical fixation of CO_2 through cycloaddition reactions with aziridines to form oxazolidinones as well as for the *N*-formylation of amines with polymethylhydrosiloxane (PMHS) and 9-borabicyclo[3.3.1]nonane (9-BBN) as reducing agents. The reported NHOs can be synthesized readily and act as highly efficient organocatalysts for the synthesis of oxazolidinones with high TONs and turnover frequencies (TOFs). Additionally, the synthesized NHOs showed excellent activities towards oxazolidinones under solvent-free and metal-free conditions.

Results and Discussion

A series of NHOs were synthesized from their precursor salts by deprotonation with KH according to a previously reported procedure (Figure 1 and Supporting Information, Section 2).[5,7,12] The resultant NHOs were obtained after simple filtration and evaporation of the solvent and utilized for the catalytic reactions without any further purification. These synthesized NHOs were screened for the cycloaddition reaction of CO_2 with aziridines. Various aziridines were synthesized through the previously reported method (Supporting Information, Section 3).[17] To check the catalytic performance of the synthesized NHOs, we chose 1-butyl-2-phenylaziridine as a model substrate for the fixation of CO_2 at room temperature. Various reaction parameters such as time, catalyst, solvent effects, and CO_2 pressure were studied (Table 1). Without the use

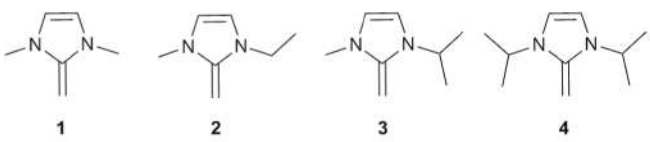
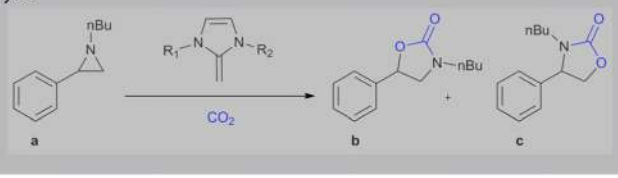


Figure 1. Catalysts (NHOs) for the synthesis of oxazolidinones.

Table 1. Optimization of the oxazolidinone synthesis using a NHO catalyst.[a]



Entry	Catalyst	Solvent	Conversion[b] [%]	b/c[b]	TON
1	–	IPA	trace	–	–
2	**1**	IPA	75	90:10	187
3	**1**	toluene	72	93:7	180
4	**1**	–	93	98:2	232
5	**2**	–	95	96:4	237
6	**3**	–	96	91:9	240
7	**4**	–	99	96:4	247
8[c]	**4**	–	58	98:2	290
9	–	–	trace	–	–

[a] Reaction conditions: aziridine (5 mmol), catalyst (0.02 mmol), CO_2 (2 MPa), RT, 3 h. [b] Determined by GC and GC–MS. [c] Catalyst (0.01 mmol).

of any NHO, a negligible amount of oxazolidinone was observed (Table 1, entry 1). Then, to investigate the catalytic activity of the synthesized NHOs, we screened **1** as a catalyst for the synthesis of the oxazolidinone and, to our delight, a good yield and regioselectivity were observed with isopropyl alcohol (IPA) as the solvent (Table 1, entry 2). Next, we studied the effect of a nonpolar solvent such as toluene; a slightly decreased amount of oxazolidinone was observed (Table 1, entry 3). In the next set of experiments, we performed the re-

action under solvent-free conditions and, to our delight, an excellent yield of oxazolidinone was observed (Table 1, entry 4); hence, we concluded that the use of a solvent is not necessary for this reaction. The effects of various NHOs for the cycloaddition reaction were studied, and we observed that all the NHOs were highly active for the synthesis of the oxazolidinone (Table 1, entries 4–7). Notably, catalyst **4** provides an excellent yield of the oxazolidinone at the room temperature with a high TON (Table 1, entry 7). We also studied the effect of catalyst loading and observed that the amount of catalyst also plays an important role in the synthesis of oxazolidinones. As the amount of NHO loading decreased, the yield of oxazolidinone also decreased (Table 1, entry 8). Without the use of solvent and catalyst, a negligible amount of oxazolidinone was noted (Table 1, entry 9). The effect of pressure on the synthesis of the oxazolidinones also played an important role in the cycloaddition reaction of aziridines with CO_2 (Figure 2 a). Among the various pressures screened, we found that 2 MPa of CO_2 pressure provides excellent yields of oxazolidinone, and as the pressure decreased, the yield of oxazolidinone also decreased. A kinetic study of the oxazolidinone synthesis showed that 3 h was the optimum time to achieve the highest yield (Figure 2 b). After the optimization of the reaction conditions, we further extended this developed protocol for the synthesis of various oxazolidinones (Table 2). Various kinds of aziridines were reacted with CO_2 to synthesize the oxazolidinones in the presence of the NHO **4** as the catalyst owing to its high reactivity. The developed NHO catalyst was extremely active and provided the corresponding 5-aryl-2-oxazolidinones in good-to-excellent yields with excellent regioselectivity. However, increasing the steric hindrance of the R^1 group of the aziridine led to a lower yield of the desired product (Table 2, entry 7). The steric hindrance could be overcome by increasing the pressure of CO_2 as well as by increasing the temperature of

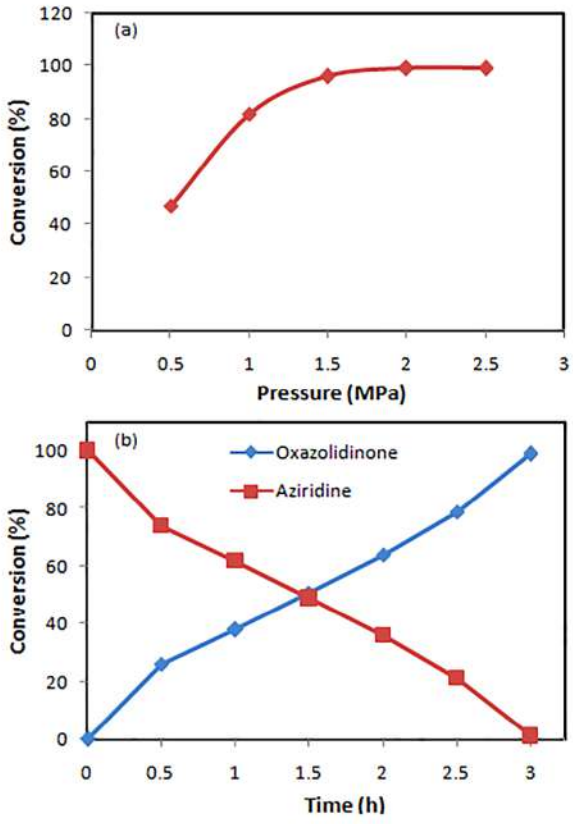
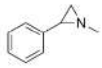
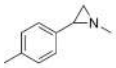
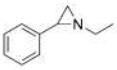
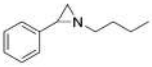
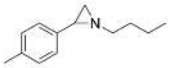
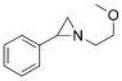
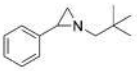
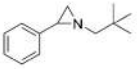
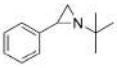
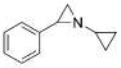
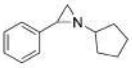
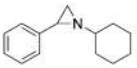
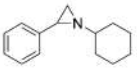
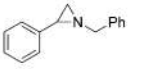
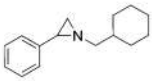


Figure 2. (a) Effects of CO_2 pressure and (b) reaction time on the synthesis of oxazolidinone. Reaction conditions: aziridine (5 mmol), catalyst (0.02 mmol), 2 MPa, RT, 3 h.

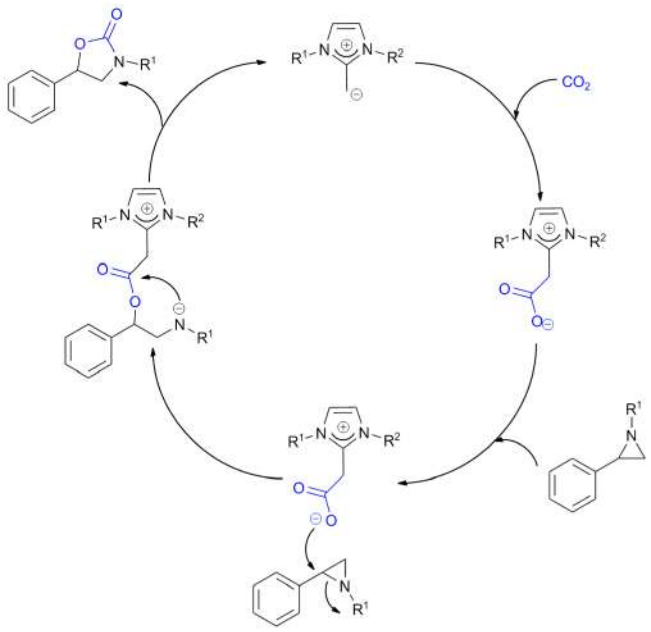
Table 2. Scope of various oxazolidinones catalyzed by NHOs.[a]

Entry	Aziridine	t [h]	Conversion[b] [%]	b/c[b]	TON[d]	TOF [h^{-1}]
1		2	99	90:10	247	123
2		2	99	96:4	247	123
3		2	97	88:12	242	121
4		3	99	96:4	247	83
5		3	96	98:2	240	80
6		3	94	99:1	235	78
7		3	39	99:1	97	32
8[c]		8	84	99:1	210	26
9[c]		8	47	98:2	117	14
10[c]		8	89	97:3	222	27
11[c]		8	87	96:4	217	27
12		3	56	99:1	140	46
13[c]		8	90	99:1	225	28
14[c]		8	93	96:4	232	29
15[c]		8	88	98:2	220	27

[a] Reaction conditions: aziridine (5 mmol), CO_2 (2 MPa), catalyst (0.02 mmol), RT. [b] Determined by GC and GC–MS. [c] 60 °C, CO_2 (4 MPa). [d] TON: sum of moles of **b** and **c** produced per mole of catalyst, TOF: sum of moles of **b** and **c** produced per mole of catalyst per hour.

the reaction to obtain appreciable yields of the expected products (Table 2, entries 8–15). In the next set of experiments, we reacted CO_2 with various cyclic aziridines, including aliphatic as well as aromatic substituents, in the presence of NHO **4** as the catalyst, and good yields and selectivity towards the 5-aryl-2-oxazolidinones were obtained (Table 2, entries 10–15). Interestingly, this protocol provides high selectivity towards (b) 5-aryl-2-oxazolidinones (more than 96%) over the 4-aryl-2-oxazolidinone (c).

A plausible reaction mechanism has been proposed for the synthesis of oxazolidinones from CO_2 and aziridines catalyzed by NHOs (Scheme 2). The olefinic bond of the NHO catalyst



Scheme 2. Proposed reaction mechanism for the synthesis of oxazolidinones using a NHO catalyst.

bearing the high nucleophilic character activates the CO_2 molecules to form a zwitterionic NHO–carboxylate (NHO–CO_2) adduct.[4,5] The NHO–CO_2 adduct then assists the ring-opening of the aziridine molecule to generate the anion. The CO_2 molecule then undergoes insertion with the anion of the amine generated from the aziridine, followed by the cyclization of the oxazolidinone. The above results indicate that the highly nucleophilic character of the NHOs provides efficient catalytic activity towards the activation of the CO_2 molecule by forming the NHO-CO_2 adduct, and this adduct plays the key role in the synthesis of the oxazolidinones under very mild reaction conditions.

Encouraged by the successful results using NHOs as the catalyst for the synthesis of oxazolidinones under ambient conditions, we further explored the application of NHOs to the formylation of amines using CO_2 as the starting material to synthesis formamides. Formamides are versatile chemicals and important intermediates that are commonly produced through the formylation of amines. The use of CO_2 instead of toxic CO for the *N*-formylation reaction is considered to be an attractive and green alternative for the production of formamides.[18] Recently, PMHS as an industrial waste product, was investigated as a hydrogen source for the formylation of amines (Table 3).[18a] A literature survey revealed that NHC-based organocatalysts are highly active for the silane activation owing to their high nucleophilicity.[19] 9-BBN is also well-documented for the reduction of CO_2.[20] Thus, owing to the highly nucleophilic nature of the synthesized NHOs, they were used for the formylation of morpholine using PMHS or 9-BBN as the reducing agent for CO_2, and the results are listed in Table 3. Without the use of any catalyst, no formylated product was observed using both PMHS and 9-BBN as the reducing agent (Table 3, entry 1). Various NHOs were tested for the formylation reaction, and good-to-excellent yields of the product were noted (Table 3, entries 2–9). Catalysts **2** and **3** produced good yields (Table 3, entries 2–5), and catalyst **4** showed excellent activity for the formylation reaction using PMHS and 9-BBN as the reducing agents (Table 3, entry 6). Next, we studied the effect of temperature on the reaction system; as the reaction temperature decreased, decreased formylation yields were noted (Table 3, entries 6–8). At room temperature, moderate yields of formylated product were still observed, and 9-BBN showed good reactivity (Table 3, entry 8). Various amine substrates, including aliphatic, aliphatic cyclic as well as aromatic amines, were well-tolerated and provided good-to-excellent yields of the formylated products under the optimized reaction conditions (Table 4).

Table 3. Formylation reaction using NHO catalyst.[a]

1 2

Entry	Catalyst	*T* [°C]	Yield[b] [%] PMHS/9-BBN
1	–	90	–
2	**1**	90	75/90
3	**1**	80	72/88
4	**2**	80	79/93
5	**3**	80	88/91
6	**4**	80	92/97
7	**4**	60	86/94
8	**4**	25	45/70
9[c]	**4**	80	61/73

[a] Reaction conditions: **1** (1 mmol), THF (3 mL), reducing agent (PMHS 2.3 mmol, 9-BBN 1.5 mmol), catalyst (5 mol%), 6 h, CO_2 (2 MPa). [b] Determined by GC and GC–MS. [c] Catalyst (2 mol%).

Various amines were formylated by using PMHS and 9-BBN as the reducing agent and NHO **4** as catalyst. Cyclic secondary amines were highly reactive and provided excellent yields (Table 4, entries 1–3 and 7). Primary aromatic amines such as aniline also provided good yields of the formylated product (Table 4, Entry 4). Simple aliphatic amines were slightly sluggish towards the formylation reactions and provided the products in moderate yields (Table 4, entries 5 and 6). A primary cyclic aliphatic amine was also reactive and provided a good yield of

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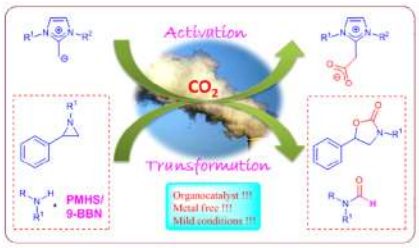
NHO limits: N-Heterocyclic olefins (NHOs) activate CO_2 for the formation of oxazolidinones from aziridines as well as the *N*-formylation of amines with polymethylhydrosiloxane (PMHS) or 9-borabicyclo[3.3.1]nonane (9-BBN) as the reducing agent. These transformations proceed under solvent-free and metal-free mild conditions.



*V. B. Saptal, B. M. Bhanage**

■■ – ■■

N-Heterocyclic Olefins as Robust Organocatalyst for the Chemical Conversion of Carbon Dioxide to Value-Added Chemicals

Smart Car Parking System using IOT: An approach for Solapur University campus

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Abstract: Currently, overcrowding of traffic increases with the raise in expansion of inhabitants hastily. The exploitation of individual vehicles also augmented, regarding the quantity of population. This enhances the traffic jamming on the road. The users prefer the private vehicles than public transportation. So, it is very complicated & unbearable to locate parking space in most urban areas, commercial areas, particularly during the scuttle hours. Therefore, we developed an IOT based smart parking system that provides information to populace for finding a parking space online. This system will be available throughout an android application to check the parking slots accessible in the parking area from everywhere around the globe. This will helps to improve a communication between smart parking system & the user. It provides an ample parking solution both for the user & owner of the parking space. It overcomes superfluous time overriding for finding the parking space in the parking areas. The present prototype model is implemented within solapur university campus users to avoid parking problem of their vehicles.

Keywords: IOT, Nodemcu, IR Sensor, Blynk Platform etc.

Introduction:

The increase in population increases the use of vehicles. To park an automobile, the unexpected disenchanted circumstances take place as the vehicle parking is not accessible and it will devour extra time and oil from the vehicle. Consequently, parking of vehicles at rush places is extremely tricky. Parking system has vicinity of extent for development. Internet of thing (IoT) has the capability to convey data through network exclusive of user interactions. Also, the system could be controlled or monitored via distant computers associated through Internet. Intelligibility would also be maintained using IoT [1-2]. IoT contains two well-known words Internet and Things. While, Internet helps the data to be sent, receive or still commune with the devices. The efficient and vigorous scenery of cloud computing allows users to create their applications on it. Cloud acts as a best option for IoT that stores all the data from sensor and also accessed from remote locations[2]. The parking crisis might cause atmosphere contamination and traffic jamming. According to the current review, there will be a speedy raise in the vehicle's populace of above 1.6 billion around 2035.Due to this, lots of fuel is being burnt every day. So, smart parking system is the best option to lessen the consumption of the fuel. It also helps to minimize user's time and competence in addition to the whole expenditure of the fuel burnt to look for the parking space. Troubles associated with parking and traffic jamming can be avoided if the drivers can be conversant in advance, regarding the accessibility of the parking spaces at and around their planned target. Herein, the output is obtained from the sensor by analyzing and processing of input data. The projected smart parking scheme consists of an on-site exploitation of an IOT unit to facilitate monitoring and signalizing the position of accessibility of parking space. This paper commence an IOT based synchronized scaffold for proficient and effortless parking of the vehicles by examining the availability of slots. The planned smart parking

framework consists of an IOT module to monitor and checking the stipulation of convenience of lone parking stain.

Materials and Methods

The basic idea of this endeavor is to reduce the society jam that occurs in and around the metropolitan areas scheduled by vehicles looking for parking. The anticipated scheme is the amalgamation of smart parking and the slot allotment through the network appliance.

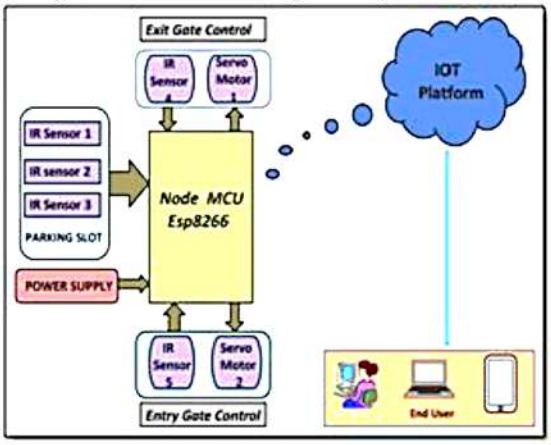


Fig.1.Block Diagram of the System

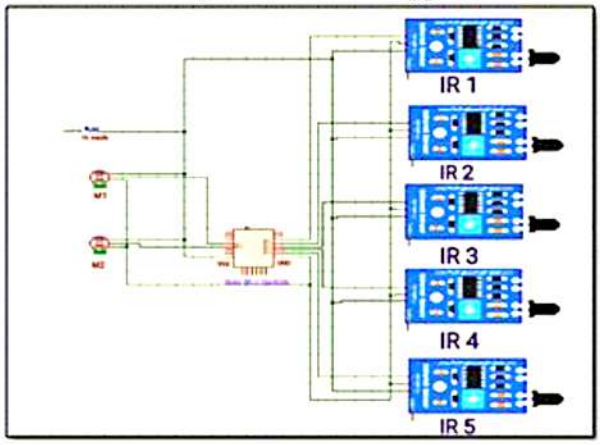


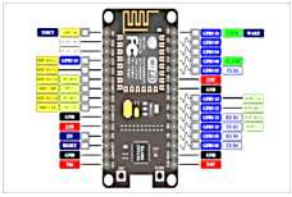
Fig.2. Circuit Diagram of the System

Fig.3.Flowchart of the proposed system

The hardware architecture of this system consists of following components:

NodeMCU (ESP-8266)

It is an open source expansion embarks and firmware, extensively used in ESP8266 -12E Wi-Fi module. This helps to program the ESP8266 Wi-Fi unit with an easy and commanding Arduino IDE[4].



ii) IR Sensor

It is an electronic device used to perceive the existence of things. This module emits an infrared light. The light detected by this module corresponds to an existence of an object and vice versa.

Power supply adapter.

The adapter is used to convert AC into DC. The adapter used in this prototype is 5V / 1.5A with the intention of the power utilization prerequisite for all circuitrary.

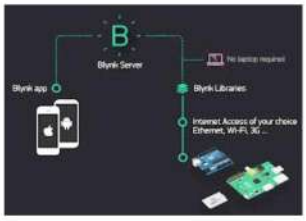
SOFTWARE DEVELOPMENT

Software architecture is developed and programmed using Arduino IDE and sent into the cloud and then the Android app synchronizes with the real-time database on the cloud.

Arduino IDE

The Arduino Integrated Development Environment (IDE) is firmware for inscribe and upload the program into the NodeMCU for provide interfacing between microcontroller and cloud [4].

Blynk Platform



Blynk is a device-agnostic IoT platform. It works with a variety of systems exclusive of any special compatibility. It is equipped with white-label mobile apps, secretive clouds, machine administration and it's learning [5].

WORKING OF THE SYSTEM

Fig.4.Experimental Set-Up of the proposed System

The proposed system consists of five IR sensor, two servo motors, nodemcu and LCD. The Nodemcu will manage the entire development and moreover send the parking accessibility information to Blynk platform thus it can be monitored from anywhere in the globe over the internet. Two IR sensors are used at entrance and way out gate to recognize the occurrence of vehicle and involuntarily open or shut the gate. Servo motors will act as entry and exit gate

and they revolve to open or close the gate. Finally, IR sensor detects the availability of parking slot and sends the data to ESP8266 accordingly. The developed android App makes our system interactive and user friendly [6].

RESULTS:

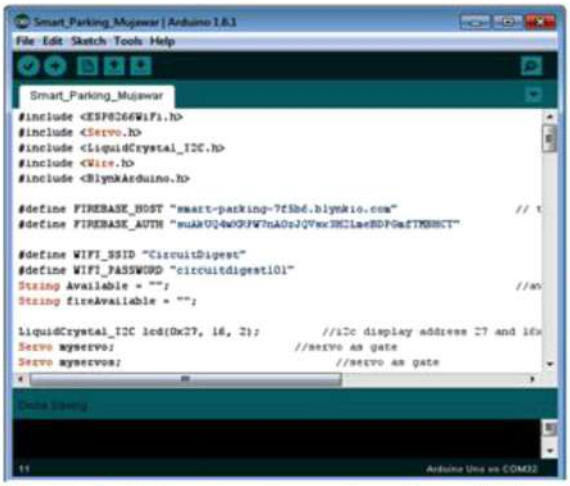


Fig.5. Arduino Programming for a System

Fig.6. Screenshots of the result

Conclusions:

This system focuses on execution of car parking place finding via Internet of Things. An Android app helps to develop an interactive and facile GUI. Online monitoring of the system avoids the time wasting of users. Embryonic a smart parking resolution in a city solves the pollution problem.

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Synthesis and Antifungal Potency against *Aspergillus Niger* of Dimalononitriles derivatives of Cyclic Imides

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ABSTRACT:

Heterocyclic imides greately involves in the development of organic synthesis. To achieve the dimalononitriles were produced by active methylene group of dinitrile with cyclic imides via microwave solvent free method. Hence the spectrochemical properties and antifungal activities persisted to very active with greater potencies against *Aspergillus niger* fungal strain.

Keywords: *phenyl succinimide, phenyl glutarimide, malononitriles, Aspergillus niger*

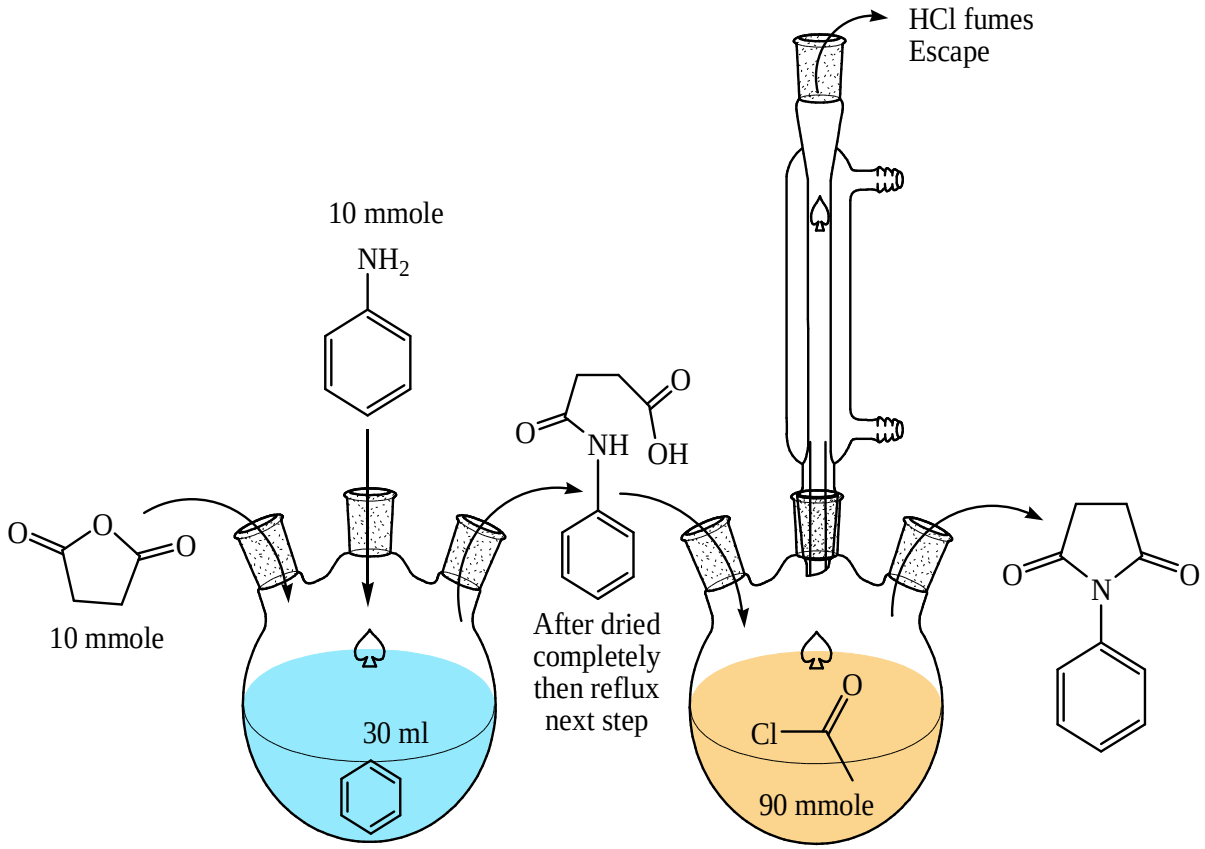
1. INTRODUCTION:

Cyclic imides are familiarized with sulphur, oxygen and nitrogen heteroatom performs the vital role in the development of pharmaceutical, biochemical and agricultural extents. Heterocyclic imide shows good CNS and anti-depressive activities [1] as well as cyclic imides [2-3] like succinimides[4-5], maleimides[6], crotonimide-C[7] of glutarimide[8-10], itaconimide and isoindole 1, 3-dione[11] showed the defensive antibacterial, antifungal, anti-proliferative[12] anxiety inhibition and depression disorder[13] activities. The synthesis of malononitrile groups furnished by knoevenagel condensation reaction utilizing active methylene groups[14] with substituted ketone, aldehydes, hetero-aromatic aldehydes or ketones or diones[15] and indole derivatives. Mostly these are synthesized by aqueous media [16], solvent one-pot[18], KOH or NaOH[19], ZnO[20] and NH_4COOCH_3[21] and tamarind juice catalyst[22]. A number of malononitrile derivatives like cyanomethyl[23], cyanoacetanilides[24], benzopyranes[25], cyanohexylidene malononitrile[26], carbonitriles[27] are simply prepared with active methylene group by conventional, grindstone method[28], solvent free one or multicomponent and microwave assisted solvent free[29] eco-friendly methods[30].

2. EXPERIMENTAL METHOD:

All the compounds were synthesized in hours from the commercially purchased aniline, succinic anhydride, glutaric anhydride, vanillin, guanidine nitrate, hydrazine hydrate, dicyanomethane, acetyl chloride, neutral alumina, benzene and ethanol. Melting points are ensured and note down by open-glass capillary and were uncorrected. IR spectra in KBr pallets were verified on

Shimadzu-FTIR: 8400S and ATR Brucker alpha FTIR spectrophotometer. ^{1}H NMR spectra were recorded by 200.13 MHz, 300.06 MHz, and 500.13 MHz using Brucker spectrophotometer. The reaction was monitored by TLC and performed using pre-coated silica-gel aluminium sheets.

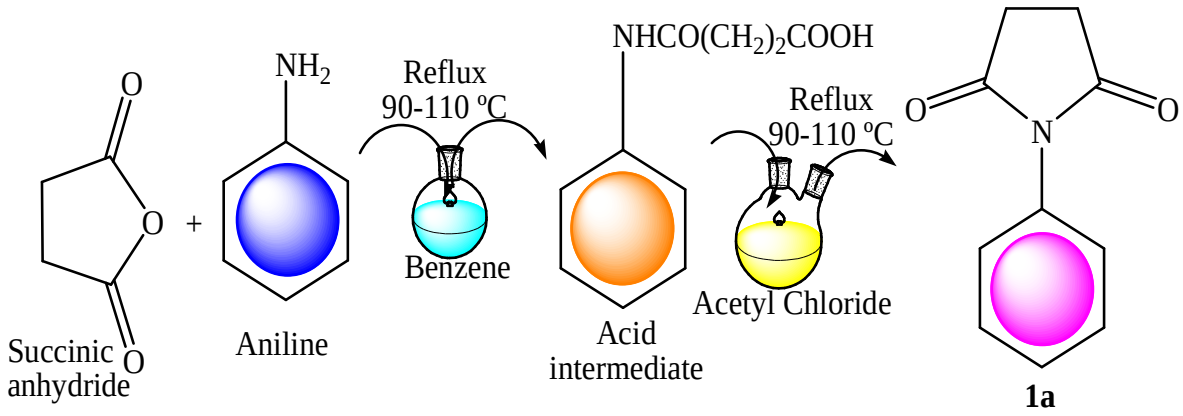


Refluxed at 90-110 ºC up to 15 - 20 minutes for both conditions

2.1 General procedure for the preparation of 1-Phenyl Succinimide and Glutarimide:

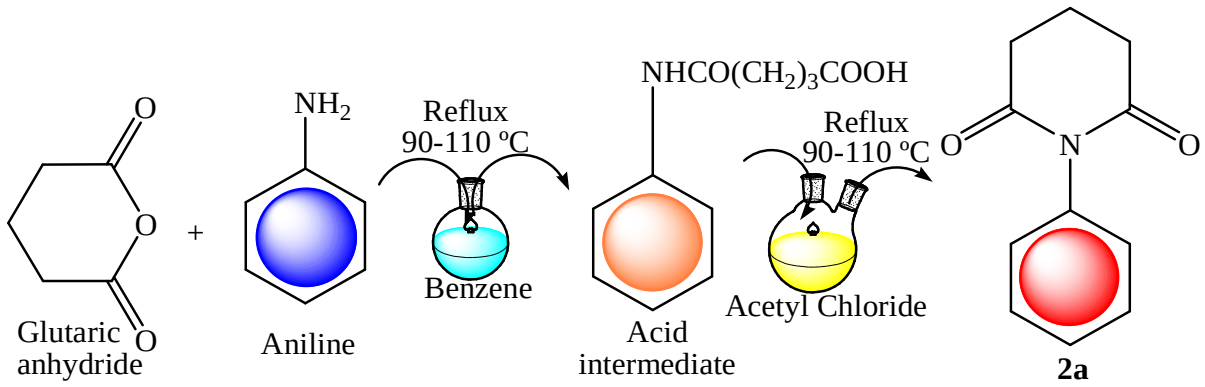
The mixture of benzene and 1mole succinic anhydride heated under reflux condition with constant stirring at 90-110 ºC for 15 to 20 minutes till the clear solution formed. Then 1mole of aniline with 5ml benzene was slowly poured into the solution constantly stirred for 15 to 20 minutes turns homogeneous solution. Upon evaporation of benzene the 3-(1-phenyl) propanoic acid intermediate was obtained. Thereafter the mixture of 3-(1-phenyl) propanoic acid refluxed with 9mole acetyl chloride by constant stirring at the same time and temperature with the complete liberation of HCl gas. Then the mixture was cooled at room temperature which accomplished

the solid products 1-Phenyl Succinimide or 1-phenylpyrrolidine-2, 5-dione (1a) as shown in the **scheme -1**.



Scheme - 1: Synthesis of Phenylpyrrolidine-2, 5-dione **(1a)**

Same procedure was applied for the preparation of 1-Phenyl Glutarimide; glutaric anhydride (1mole) was refluxed with aniline (1mole) which form 3-(1-phenyl) butanoic acid and then refluxed with acetyl chloride (9mole) by constant stirring at the similar time and temperature, the 1-phenylpiperidine-2, 6-dione (2a) solid product was obtained in the **scheme -2.**

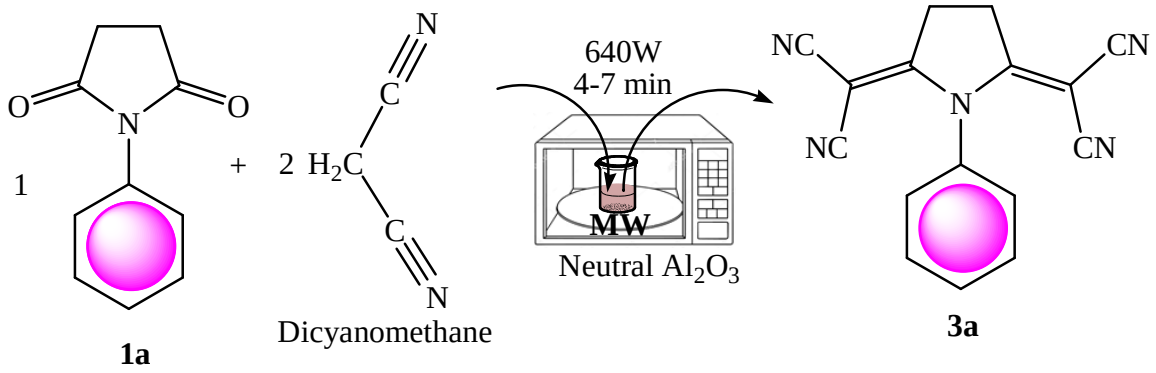


Scheme - 2: Synthesis of 1-phenylpiperidine-2, 6-dione **(2a)**

2.2 General procedure for the preparation of Dimalononitriles:

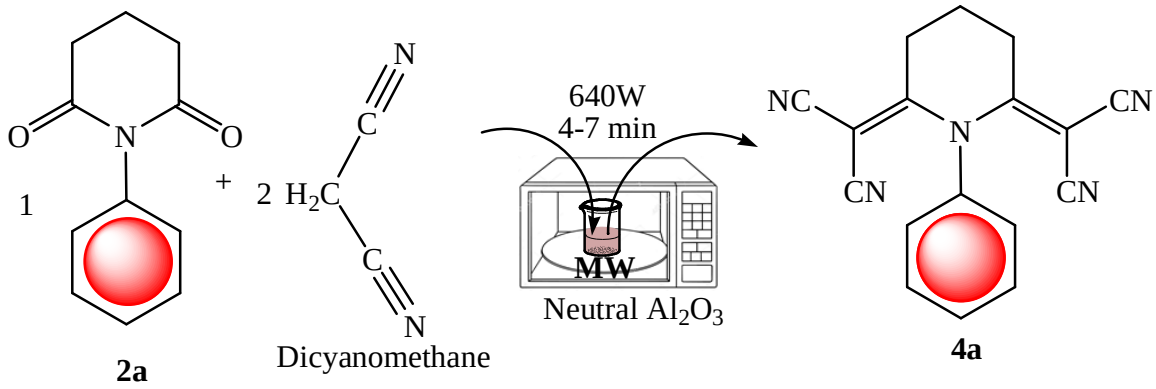
Malononitrile derivatives were synthesized by eco-friendly system. The mixture of 0.02mole of afforded 1-phenyl succinimides **1a** and 0.04mole of dicyanomethane in 2 gm of neutral Al_2O_3

irradiated by microwave in solvent free state on 640W power for 4-7 minutes accomplished the 2,2'-(1-phenylpyrrolidine-2,5-diylidene)dimalononitrile (9a) in the **scheme-3**.



Scheme - 3: Synthesis of 2,2'-(1-phenylpyrrolidine-2,5-diylidene)dimalononitrile **(3a)**

By working same method the 2,2'-(1-phenylpiperidine-2,6-diylidene)dimalononitrile (10a) derivative was synthesized by 0.02mole of afforded 1-phenyl glutarimides **2a** and 0.04mole of dicyanomethane in 2 gm of neutral Al_2O_3 by microwave supported solvent free state on same watt power and time as shown in the reaction **scheme-4**.



Scheme - 4: Synthesis of 2,2'-(1-phenylpiperidine-2,6-diylidene)dimalononitrile **(4a)**

2.3 Spectral Analysis:

2.3.1 1-phenylpyrrolidine-2, 5-dione(1a):

M.F.: $C_{10}H_9NO_2$, C,H,N Observed: C, 68.15; H, 4.10; N, 8.50, FTIR (KBr): >C=O (2-Peaks): 1708cm^{-1} and 1774cm^{-1}, cyclic CH_2-CH_2: 2937 cm^{-1}, cyclic imines 1291cm^{-1}, Ar (3-Peaks): 1457cm^{-1}, 1502cm^{-1} and 1595 cm^{-1}, ^{1}H NMR-(300.06 MHz, $CDCl_3$, δ ppm) : 7.45-7.25 (m, 4H, Ar-H), 2.92 (s, 4H, imide)

2.3.2 1-phenylpiperidine-2, 6-dione(2a):

M.F.: $C_{11}H_{11}NO_2$, C,H,N Observed: C, 69.89; H, 5.46; N, 7.49, FTIR (ATR): >C=O (2-Peaks): 1694cm^{-1} and 1770cm^{-1}, cyclic CH_2-CH_2-CH_2: 2971cm^{-1}, cyclic imines 1314cm^{-1}, Ar (3-Peaks):

1499cm^{-1}, 1535cm^{-1} and 1598cm^{-1}, ^{1}H NMR-(300.06 MHz, $CDCl_3$, δ ppm) :7.92-7.33 (d, 4H, Ar-H), 1.80 (m, 2H, –CH_2-CH_2-CH_2–), 2.27 (t, 4H, imide)

2.3.3 2,2'-(1-phenylpyrrolidine-2,5-diylidene)dimalononitrile(3a)

M.F.: $C_{16}H_9N_5$, C,H,N Observed: C, 71.34; H, 3.68; N, 25.98, FTIR (ATR): -Ca”N (1-Peak): 2194cm^{-1}, cyclic CH_2-CH_2: 2918cm^{-1}, cyclic imines 1379cm^{-1}, Ar (3-Peaks): 1499cm^{-1}, 1550cm^{-1} and 1683cm^{-1}, ^{1}H NMR-(300.06 MHz; DMSO-d_6; δ ppm): 2.76 (s, 4H, imide), 7.47-7.27 (m, 5H, Ar-H)

2.3.4 2,2'-(1-phenylpiperidine-2,6-diylidene)dimalononitrile(4a):

M.F.: $C_{17}H_{11}N_5$, C,H,N Observed: C, 71.84; H, 4.42; N, 24.78, FTIR (KBr): -Ca”N (1-Peak): 2338cm^{-1}, cyclic CH_2-CH_2-CH_2: 2962cm^{-1}, cyclic imines 1317cm^{-1}, Ar (3-Peaks): 1501 cm^{-1}, 1541 cm^{-1} and 1602 cm^{-1}, ^{1}H NMR-(500.13 MHz; DMSO-d_6; δ ppm): 1.81 (m, 2H, imide), 2.28 (m, 4H, imide), 7.58-7.02 (m, 5H, Ar-H)

2.4 Antimicrobial Assay:

All the compounds were evaluated their antibacterial actions counter to *Aspergillus niger* (NICM-545) fungal strains at the concentration 100µg/mL per disc employing the paper disc diffusion method using DMSO solvent. Amphotericin-B was used as standard drug for antifungal activities. Zone of inhibition measured by digital vernier caliper in the figure-1and readings are noted.

Fig 1: Antifungal activities of cyclic imides and dimalononitriles

3. RESULT AND DISCUSSION:

Cyclic imides **1a**, **2a** were prepared by conventional routes. Thereby eco-friendly microwave assisted solvent-free methods with neutral corundum (Al_2O_3) catalyst were practiced for further derivatives. The dimalononitriles **3a** and **4a** are prepared from cyclic imides. Physicochemical

data and spectral anal of all the synthesized compounds were verified. In the antibacterial frame of references, almost all the prepared derivatives are very active against *Aspergillus niger* fungal species.4. CONCLUSION:

At the end of the line, dimalononitriles derived from cyclic imides as starting components were synthesized by eco-friendly microwave system. These derivatives are very active against *Aspergillus niger* fungal strains. A few derivatives are highly potent against fungal species as compare with the standard drug. According to solvent free microwave route of the synthesis and antifungal efficacies, they might be used for different substituted heterocyclic entities.

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Natural Indicator Extracted From Flower Petals

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ABSTRACT

Different types of flowers were collected and from their extract they were tested for indicator properties in acid -base titration. Now a day synthetic indicator are the choice of acid base titration but due to environmental pollution , cost , availability of synthetic indicator so there is a need for search natural compound as an acid- base indicator. Present work focus on use of flower petal extract indicator in acid – base titration. These natural compound is easy to prepare extract and easy to available and it also promising titration result.It is showing sharp colour change at equivalent point. It tested with standard synthetic indicator. This indicator is used in all type of acid-base titration exception of weak-acid & weak-base titration. It was found very useful, economical, simple & accurate indicator for titration.

INTRODUCTION

The use of local material has been subjected to cost oriented study by scientist over the year. So flower is one of the important local materials that could be used as standard indicator in chemistry.Indicators are chemical substance added in small quantity to solution to determine the acidity & alkalinity of solution. This can through colour change. Indicators are weak organic acid or base. It can exist in more than one structural form i.e. Tautomer's. Indicator colour change depending on acidity & basicity of solution. Any highly coloured flower petals extract has been used as acid-base indicator.

Flower Collection

The plant namely

1.***caesalpiniapulcherrima (shankasur) ,***

2.euphorbiamili ,

3. cascabiathevisia.

This plant flower well collected form our college campus.

Extraction procedure:

The fresh flower petals of above flowesr were separated out form whole flower & washed with distilled water to remove dirt. About 5 gm of flower petals were grounded in mortal with a pestle & then it transfer into beaker. 20 cm^3 mixture of ethanol & acetone as 1:1 ratio was added stair for 5 min. The colour from the petals was in solution. This was cooled & filtered clean, labeled bottle.

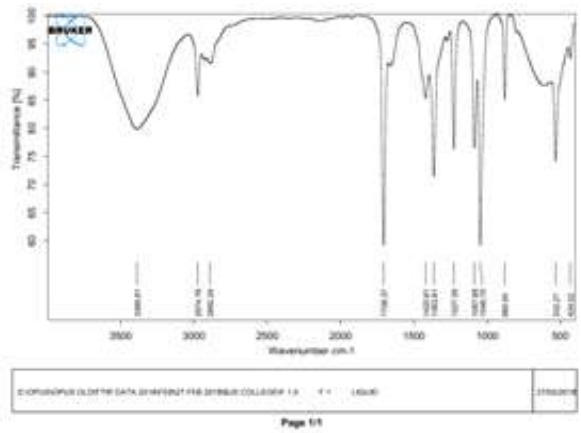
Testing the indicator property of extract / titration:

The drop of extract added in 25 cm3 of 0.5 M sodium hydroxide (flask) and titrate against 0.1 M HCL (burette).The extract of flower is tested with acid-base solution & result recorded in observation table. Generally 3 drops of indictor extract was added into 0.5m sodium hydroxide (NaOH) against 0.1m hydrochloric acid (HCl). Average volume of end point,colour change, pH was reported in observation table.

Observation Table

Plant name	Family	Colour of extract	Ph of extract	End point	Colour change
Caesalpiniapulcherrima	Caesalpiniaceae	Wine red	7.72	10.1	Greenish to colourless
Euphorbia mili	Euphorbiaceae	Yellow	5.53	10.3	Yellow to colourless
Cascabiathevisia	Apocynaceae	Yellow	6.50	10.6	Yellowish to colourless

IR ANALYSIS



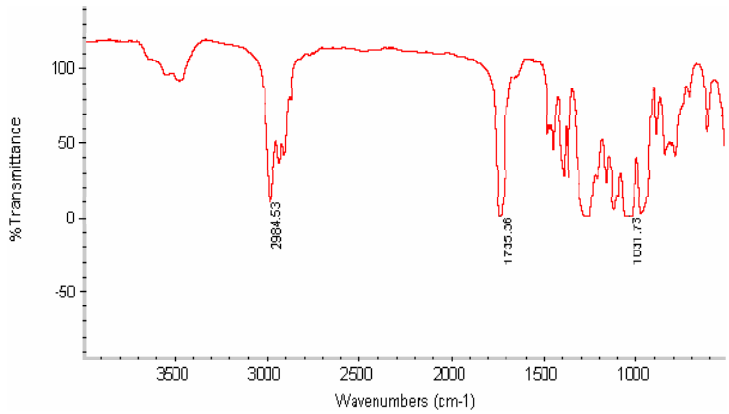
Natural Indicator : (F1)*I*

R : 3389, 2974, 1706, 1227 cm^{-1}.

Natural Indicator :(F2)

IR : 3392, 1703, 1653,1421 cm^{-1}.

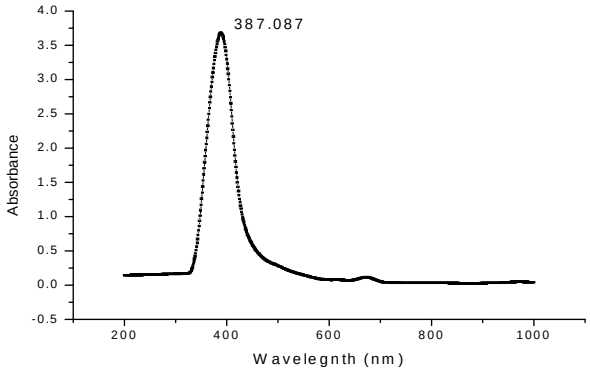
Synthetic Indicator :(Phenolphthalein)



IR :2984, 1735, 1031 cm^{-1}.

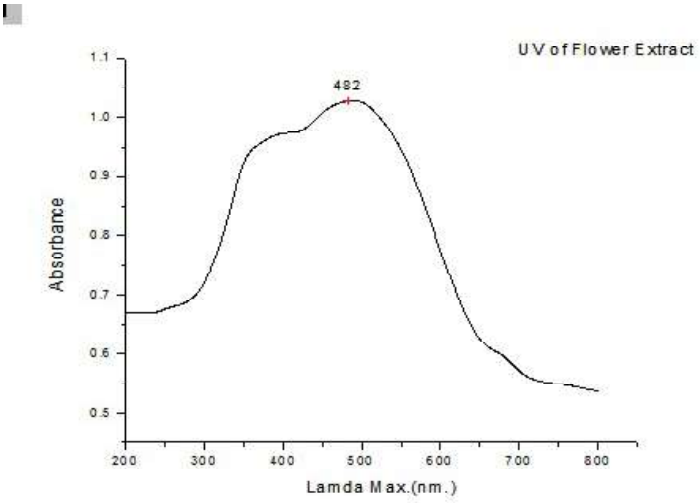
UV ANALYSIS

Natural Indicator : (F1)



λ = 387 nm

Natural Indicator : (F2)



Result &Disscution

Result were obtained colour change by titration method at equivalence point obtained which reported in above observation table. This result can match the synthetic indictors. Thus it is clear that flower petals extract produced colour change & it can use to acidity & alkalinity of solution. It also reported that all bright coloured flower are used as indicator in acid-base

titration. This titration conducted by 3 drops of extract shows colour change & equivalent point was as colorless. The spectral interpretation of a flower extract were IR frequency absorb mainly at 533 cm^{-1} , 879 cm^{-1} and UV absorbance at 482 nm.

The end point colour's were the same that is colourless for each extract and the average titrate value matched with standard synthetic phenolphthalein indicator are compared on above observation table

Conclusion

Overall, it indicates that it is alternative way of use of natural indicator by replacing synthetic indicator. The study also recommends the spectral interpretation of flower extract should be carried out in order to ascertain their structures. These also gives minimize use of chemicals. Which also in favor environment & green chemistry.

APPLICATION

1. This is cheap indicator.
2. It is simple to prepare.
3. It gives accurate result of titration.
4. It is an alternative way or it replace the synthetic indicator.
5. Only 3 drops of indicator are sufficient for titration.
6. This indicator also related to ***Green Chemistry***product.

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Thank You...!!!