

## अहिराणी कथा व लोकसंस्कृती

डॉ. राजेंद्र देवरे - लोणावळा कॉलेज, पुणे

आजच्या धुळे, जळगाव व नाशिकच्या भूप्रदेशाला खान्देश असे म्हटले जाते. महाराष्ट्राचे पश्चिम, कोकण, विदर्भ, मराठवाडा, उत्तर महाराष्ट्र असे चार विभाग आहेत, त्यातलाच एक प्रादेशिक विभाग म्हणजेच खान्देश. हि विभागणी फक्त प्रशासनाच्या गरजेनुसार झालेले नसून प्रत्येक विभागाची भाषा, संस्कृती, निसर्ग यांच्यानुसारही झालेली आहे. प्रत्येक विभागाने भूप्रदेशानुसार आपले स्वतंत्र अस्तित्व जपले आहे. आपले वेगळेपण सार्थपणे जतन करून खान्देशी संस्कृतीला महाराष्ट्राच्या उपसंस्कृतीचे स्थान प्राप्त करून दिले आहे.

**खान्देशची प्राचीनता-** महाराष्ट्रात 'खान्देश' हा प्राचीन काळापासून एक स्वतंत्र विभाग आहे. खान्देशची स्वतंत्र प्राचीन संस्कृती आहे. या संस्कृतीला हजारीवर्षाची परंपरा असल्याचे दिसते. खान्देशात पूर्व खान्देश आणि पश्चिम खान्देश असे दोन स्वतंत्र विभाग होते. आजचे जळगाव (जिल्हा) आणि धुळे, नंदूरबार जिल्हा मिळून पुर्वीचा खान्देश होय. "खान्देश या नावावरून अनेक तर्क-वितर्क केले जातात. हे नाव अलिकडच्या काळातले असावे असे अभ्यासकांचे म्हणणे आहे. कै. वि. का. राजवाडे यांच्या मते खान्देश हे नाव मध्यप्रदेशातील बन्हानपुरच्या किंवा अलजपुरच्या नवाबांनी दिले असा कित्येक युरोपीयानांचा व एतद्देशीयांचा तर्क आहे. 'खान' या शब्दाकडे पाहता सकृत दर्शनि हा तर्क खरा असावा असे समजण्याकडे प्रवृत्ती होती. परंतु किंचित सुक्ष्म दृष्टीने पाहिले असता असे दिसून येते की, हा शब्द अगदी शुद्ध प्राकृत आहे. या प्रांताचे मुळचे नाव कन्हदेश. कन्हदेश म्हणजेच कृष्णदेश. देवगिरीच्या यादव कुळात 'कृष्ण' उर्फ 'कंद' नावाचा राजा झाला त्याने आपले नाव या प्रांताला दिले. कन्हदेश, कान्हदेश, काहनदेश, खान्देश अशा परंपरेने अपभ्रंश होत 'खान्देश' असे नाव प्रचलित झाले."

खान्देश हा महाराष्ट्र राज्याचा एक भाग आहे. भारतीय संस्कृती कोषात प्राचिनकाळी हा भाग 'ऋषिक देश' या नावाने ओळखला जात असे. 'रामायण महाभारत यातील 'ऋषिक देश' या देशाचा उल्लेख एकत्र केले असता, त्याच्या पुर्वेस प्राचीन विदर्भ उत्तरेस मालव, दक्षिणेस अश्वक म्हणजे सांप्रतचा मराठवाडा हे देश असल्याचे कळते, त्यावरून भौगोलिक परिस्थितीशी जुळणारा भूभाग म्हणजे खान्देश."

खान्देशाच्या प्राचीनते संदर्भात अनेक अभ्यासकांनी आपली मते मांडली आहेत. महाराष्ट्र ज्ञानकोष, डॉ. प्र. न. देशपांडे, श्री. दा. गो. बोरसे, प्रा. राजा महाजन, चि. वी. वैद्य यांनी ही खान्देशाच्या प्राचीनते संदर्भात अभ्यास केला आहे. खान्देशाला प्रदिर्घ अशी अतिप्राचीन, प्राचीन मध्ययुगात, अर्वाचीन, सामाजिक, ऐतिहासिक, भौगोलिक परंपरा आहे.

खान्देशाला लोकइतिहासाची, संस्कृतीची व्यापक बैठक लाभली आहे. येथील मौखिक परंपरा जबरदस्त असून लोकमानसांत तीने कायमचे

घर केले आहे. त्यामुळे सर्वकालिन सांस्कृतिक घटनांशी खान्देशाचा संबंध जोडणाऱ्या दंतकथा, लोकगीते, परंपरा प्रचलित आहेत. प्रस्तुत ठिकाणी दंतकथा व लोकगीतांच्या अनुषंगाने भौगोलिक व सामाजिक संदर्भाकडे दृष्टीक्षेप टाकण्याचा प्रयत्न केला आहे.

**खान्देशातील लोककथा**

खान्देशातील लोकांची प्रमुख बोली अहिराणी आहे. अहिराणी ही खान्देशातील बहुजणांची, विहित जाती-जमातींची थोड्याफार फरकाने बोली आहे. अहिराणी लोकसाहित्यात जात्यावरची गाणी, ओव्या, झोक्यावरील गाणे, सणउत्सवाची गीते लौकिक गीते, कानबाईची गाणी, लोककथा, म्हणी, वाक्प्रचार, लोकसमजुती, व्रतवैकल्य यांच्या देव-देवतांबद्दलच्या कथा इत्यादी विविध प्रकारचे लोकसाहित्य आहे. लोककथांचा विचार करता १) पौराणिक कथा २) सामाजिक कथा ३) देव-देवतांपर कथा ४) प्रेम कथा ५) मनोरंजक कथा ६) उपदेशपर कथा ७) अद्भुत कथा इत्यादी वर्गीकरण करता येईल.

**पौराणिक कथा -** भारतीय जणमानसांवर धार्मिकतेवर फार मोठा पगडा आहे. मराठी भाषेत जशा अनेक प्रकारच्या पौराणिक कथा आहेत. तशाच थोड्याफार फरकाने स्थानिक परंपरेनुसार अहिराणी भाषेत सुद्धा अशुभनिवारणासाठी लोककथा सांगितली जात असे. कहाणी किंवा कथा सांगणे आणि ऐकणे याला धर्माचरणाचा एक भाग बनविले. शंकर-पार्वती, राम-लक्ष्मण, सीता यांच्या विषयीच्या अनेक लोक कथा उपलब्ध आहेत. वाल्ह्याकोळीची गोष्ट ही जशी मराठीत आहे तशीच अहिराणी भाषेतसुद्धा आहे व तिला स्थानिक संदर्भही आहेत. चाळीसगांव तालुक्यात वालझिरी, रांजणगांव, पाटणादेवी या गावात वाल्ह्याकोळी (वाल्मिक ऋषी), राम-सीता रहात असल्याच्या समजुती आहेत. वालझिरी येथे वाटमारी करून राहणारा वाल्ह्याकोळीचे म्हणजेच वाल्मिक ऋषींचे तिर्थक्षेत्र आहे. त्याचप्रमाणे पाटणादेवीच्या जंगलात सीता न्हानी, रामकुंड अशी ठिकाणे आजही आहेत.

'गंगा मा आंघोय', 'शंकरजीना नंदी', 'रामना जलम', 'देव देस', 'शंकर-पार्वतीना फेरा', 'जामुननी गोट', इत्यादी प्रातिनीधीक अहिराणी कथा सांगता येतात. खान्देशातील बहुतेक गावात शंकराचे मंदिर असल्याचे दिसते. स्थानिक देवदेवतांनुसारही कथा निर्माण झाल्या आहेत. महादेवाच्या मंदिराप्रमाणेच रामाची, बालाजीची, भवानीची मंदिरे आहेत. अहिराणी भाषीक जणमानसांत पुराणातल्या रामाच्या लोककथाही आहेत. श्रावणबाळ, भक्त प्रल्हाद इत्यादींच्या कथा आजही अहिराणी भाषेत सांगितल्या जातात.

खेड्यापाड्यात भवानी मातेची मंदिरे आहेत. यामुळेच भवानीमातेच्या अनेक लोककथा ही निर्माण झाल्या आहेत. स्थानिक दुकानदार किंवा विक्रेता आपल्या मालाची दिवसाची पहिली विक्री करताना आपल्या देवतेला स्मरण करून बोहणी करतो. बोहणी हे भवानी मातेचे उपभ्रंश रूप असावे, त्यावरूनच बोहणी करणे ही प्रथा सुरु झाली असावी असे वाटते.

नंदिच्याकथा, 'शंकरजीना नंदी', 'शंकरजीना जटाना बाल' इत्यादी कथा शंकराशी संबंधीत आहेत. शंकरजीना नंदी या कथेत नंदी हा प्रमुख मानला जातो. कृषीप्रधान संस्कृतीमुळे शेतीसाठी उपयुक्त असणाऱ्या सर्व घटकांना, वस्तुंना देवत्व प्राप्त होते. म्हणूनच खान्देशात शंकराच्या मुर्ती समोर नंदी हा असतोच. या नंदीची ही पुजा केली जाते त्यामुळेच महादेव आणि नंदी यांच्या भोवती लोककथा निर्माण झाल्या आहेत. गावागावामध्ये नंदीच्या रूपाने वळू देवाला सोडला जातो.



### प्रसार माध्यमातला लेखक - ह.मो.मराठे

डॉ. राजेंद्र देवरे

लोणावळा महाविद्यालय

प्रसारमाध्यमे म्हटली की, आकाशवाणी, दूरदर्शन व वृत्तपत्र ही तीन प्रभावी माध्यमे मानली जातात. आधुनिक काळात इंटरनेट, जाहिराती, सिनेमे, मोबाईल व मोबाईलशी संबंधित असणारी फेसबुक, व्हॉट्स-अप इत्यादीही प्रसारमाध्यमे प्रभावीपणे कार्यरत असल्याचे दिसते. या प्रसारमाध्यमांचे महत्वाचे कार्य म्हणजे समाजाशी संवाद साधणे हे असते. समाजाला घडवणे, विचारांचे आदान-प्रदान करणे, समाजाला योग्य दिशा देणे हे आहे. केवळ प्रबोधन करणे हा प्रसारमाध्यमांचा हेतू नसतो. तर समाजाच्या सांस्कृतिक, सामाजिक, राजकीय, आर्थिक, धार्मिक व ऐतिहासिक बाबींच्या अनुषंगाने भाष्य करण्याचे कार्य माध्यम करीत असतात. एकंदरीत समाजाची वैचारिकता ह्या माध्यमांमुळे प्रगल्भ होत असते. समाजाचे सांस्कृतिक व वैचारिक उन्नयन व अधःपतन होण्यासदेखील प्रसारमाध्यमेच जबाबदार असू शकतात. परंतु प्रस्तुत ठिकाणी प्रसारमाध्यमांमध्ये मुद्रित प्रसार माध्यमांचा व साहित्याचा असणारा संबंध, ह.मो.मराठे या लेखकाच्या अनुषंगाने शोधण्याचा प्रयत्न केला आहे.

वृत्तपत्रे ही लोकशाहीचा चौथा स्तंभ म्हणून ओळखली जातात. बाळशास्त्री जांभेकरांपासून (दर्पण) मराठी वृत्तपत्राला सुरुवात झाली. आधुनिक काळात आधुनिक मराठी वाङ्मयाचा पाया घालण्याचे श्रेय वृत्तपत्रांना द्यावे लागते. विविध वाङ्मयाचा परिचय किंवा निर्मितीचे मूळ वर्तमानपत्रेच आहेत असे म्हणता येते. याच वृत्तपत्रे, नियतकालिके यांच्यामुळे अनेक लेखक घडले आहेत. त्यांना लेखनासाठी याच प्रसारमाध्यमांनी वेगवेगळे अनुभव देऊन लिहिते केले आहे. त्यातूनच त्यांची साहित्यिक जडणघडण होत गेली. यात विष्णुशास्त्री चिपळूणकर, लोकमान्य टिळक, गो.ग.आगरकर, महात्मा फुले, लोकहितवादी, न.चिं.केळकर इत्यादींची नावे या संदर्भात घेता येतात. ह.मो.मराठे हे सुद्धा वर्तमानपत्रात काम करणारे लेखक, त्यांना प्रसारमाध्यमांनी घडवले, लेखनाला विषय पुरवले असे म्हणता येते.

#### ह.मो.मराठे यांचे साहित्य व त्यांची जडणघडण -

जडणघडण - ह.मो.मराठे यांनी १९६० नंतरच्या कालखंडात लेखनाला सुरुवात केली. हा कालखंड तसा स्थित्यंतराचा कालखंड. औद्योगिककरणामुळे खेड्यातील नवशिक्षित तरुण शहराकडे धाव घेऊ लागली. पाश्चात्य संस्कृतीचा वाढता प्रभाव व शहरी संस्कृतीचे आकर्षण यामुळे शहरांची बकाल महानगरे झाली. अपेक्षाभंग झालेल्या कालखंडात ह.मो.ची जडणघडण झाली. कोकणातून कोल्हापूर, मुंबई, पुणे असा त्यांचा प्रवास सांगता येतो. मराठी विषयात बी.ए.केल्यावर एम.ए.करण्याची इच्छा असूनही मालवणलाच 'मास्तरकी' केली. उच्च शिक्षणाची आवड, त्यात मराठी साहित्य, पत्रकारिता यांची ओढ त्यांना गप्प बसू देत न्हवती. या काळात त्यांनी सत्यकथेतून कथा लेखनही केले. 'महाराष्ट्र टाईम्स' मध्ये इंग्रजीच्या अपुऱ्या ज्ञानामुळे त्यांना नोकरी मिळाली नाही म्हणून निराश न होता कोल्हापूरला 'इंद्रधनुष्य' दैनिकात शिकाऊ उमेदवार म्हणून काम करण्याची संधी मिळाली. एम.ए. व पत्रकारिता करण्याची संधी एकाचवेळी मिळाल्याने पत्रकारितेला सुरुवात झाली. त्यांनी पुढे अनेक वर्तमानपत्रांमध्ये कामे केली. शिकाऊ उमेदवार ते मुख्यसंपादकापर्यंतचा त्यांचा प्रवास व या प्रवासात आलेले बरे-वाईट अनुभव त्यांना लेखनाला प्रेरणादायी ठरले. एका वर्षाच्या प्राध्यापकाच्या नोकरीनेही त्यांना लेखनाला प्रेरणा मिळाली. शैक्षणिक गुणवत्तेच्या आधारे दुसरीकडे प्राध्यापकाची नोकरी मिळेल असा आशावाद होता. परंतु त्यांना प्राध्यापकाची नोकरी मिळत नाही. उमेदवारीच्या काळात संघर्ष करावा लागवा. कोल्हापूरसारख्या

# A study of Ants as a Suitable Learning Cycle to Investigate for Studies through Observations

Pokale S. S.

Department of zoology

Dr.B.N. Purandare Arts, Smt. S.G. Gupta Commerce and Science College, Lonavala - 410403. Maharashtra, India

## ABSTRACT

This activity capitalizes on the interest that animal behavior can generate to introduce and reinforce student understanding of the scientific method. Specifically, our activity highlights the general utility of the scientific method and uses this method to examine ant social behavior, with emphasis on generating and testing hypotheses. Furthermore, this activity introduces the idea of animal societies and encourages students to apply the concepts they learn to other species, including humans. By collecting ants, this experience situates learning in the context of students' own communities.

Field observation is an important tool for generating interest for undergraduate learners in the subject of Zoology. Such observations with respect to environmental adaptations, foraging, nesting and territorial behavior can be recorded without causing any damage to the organisms under study. The ants as one of the commonly occurring insects offer good opportunities for observational studies. An example of observational study of observation, ants can be effectively used to generate subject interest and inculcate research aptitude among the learners.

**Keywords:** Ants, Observations.

## INTRODUCTION

In biological science, field observation is considered as an effective tool to understand diversity, similarity in the habitats and general behavioral patterns of organisms. These

# Alternative to Dissection are a more effective real instructional aid than traditional dissection.

S. S. Pokale

Department of Zoology

Dr.B.N. Purandare Arts, Smt. S.G. Gupta Commerce and Science College, Lonavala - 410403. Maharashtra, India

(Affiliated to Savitribai Phule Pune University)

Email: - [spokale7@gmail.com](mailto:spokale7@gmail.com)

## ABSTRACT:

In the National Conference on Animal Dissection -Need and Alternatives, held on 3<sup>rd</sup> and 4<sup>th</sup> February, 2017 teachers, students and research scholar concluded that Alternatives were more contractive productive and effectual than traditional dissection methods.

Animal Dissection has increased magnified a large scale causing andiscriminative disruption of the natural habitat and a threat to biodiversity and ecological environment. Threatened species are becoming extinct.

Teaching methods that have animals influence the students negatively and thereby they may develop a callous attitude to both animals and humans. Thus, dissections have a negative Psychological impact a student. As citizen of India, it is our duty to at side by the constitution and its articles which states it is duty of every citizen to protect the natural environment including forests, lakes and wildlife.

Prevention of cruelty to Animals Act 1960 required that animal dissection should be avoided as for as possible and alternatives like books, models, filum ,3D images, and the like should serve as teaching devices.

Therefore, all the Alternative involved in dissection of animals should adhere to the "Ethics" issue which teachers' human beings to be compassionate towards animals. There has been a proliferations of new learning materials that can substitute dissection, that include compacta-based programs aminated sections of films or artists rend enring.

**KEY WORDS: - Effective instructional alternative methods**

## INTRODUCTION :-

Animals have long played an important role in education and research. In higher education, in particular, animals are used to teach systematics, anatomy, physiology, pharmacology, and psychology. Many science courses use dissection to help students understand animal anatomy and also to provide them with skills in medical operation/surgical techniques. The practice of animal dissection in laboratories dates back to the late 1800's. The two aspects of animal killing in science education include dissection and vivisection, for which approximately 170 species of animals are used. Dissection is the exploration of dead animals to study their anatomy and physiology, whereas vivisection is animal experimentation, involving cutting, burning, shocking, drugging, starving, irradiating, blinding, or killing of animals.

Indeed, dissection is not a global phenomenon: it is no longer practiced in primary and secondary schools in The Netherlands, Switzerland, Argentina, Slovak Republic, and Israel, and is rare in schools in Sweden, Germany, and England (Balcombe, 2001; Waltzman, 1999).

# DIVERSITY OF CHOLOROPHYCEAE IN VALVAN LAKE OF MAVAL

S. S. Pokale

Department of zoology

Dr.B.N. Purandare Arts, Smt. S.G. Gupta Commerce and Science College, Lonavala -410403.

Maharashtra, India

(Affiliated to Savitribai Phule Pune University)

## ABSTRACT: -

Valvan Lake is a principal fresh water body located in Maval Tehsil, Pune, Maharashtra. It is situated at about 159 m above the mean sea level. A study of Rotifer was undertaken during 2014 to 2015, one years to assess the types of Chlorophyceae present in this water body. This water body is utilized by local residents for washing clothes and also for open defecation. Siltation is also responsible for polluting the water. The Chlorophyceae are large and an important group of freshwater green algae. They include some of the most common species which are important both ecologically and scientifically. During the present study 24 species of Chlorophyceae were found at all sampling sites of Lake.

Keywords: - Valvan Lake, Chlorophyceae, Diversity.

## INTRODUCTION

Chlorophyceae (from the Greek word chloros, meaning “green”) make up an extremely large and important class of green algae and these are distinguished mainly on the basis of ultra structural morphology. Members may be unicellular, colonial or filaments. The green algae (Chlorophyceae) compose the largest and most varied phylum of algae and they are the most closely related to the higher plants because of their similar photosynthetic pigments, storage of starch and the fine structural organization of the chloroplast. (Happy Wood, 1988) The green algae include a greater diversity of cellular organization and morphological structure than are found in any other algal division. There are approximately 350 genera and 2650 living species of Chlorophyceans. They come in a wide variety of shapes and forms, including free-swimming unicellular species, colonies, non-flagellate unicellular, filaments.

## MATERIAL AND METHODS

The water samples were collected from the four sites of Lake such as site A, site B, site C. and site D. The samples were collected in the morning hours between 8.30 a.m. to 10.30 a.m. 50 liters of water sample was filtrated through the plankton net made of bolting silk number 25 with mesh size 64 lime. The collected samples were allowed to settle down by adding Lugol’s iodine. Sedimentation of

## **EFFICACY OF VARIOUS ALGORITHMS IN OZONE ESTIMATION USING GOES SOUNDER RADIANCES**

**Ranju B Chopra**

Assistant Professor, Deptt. of Physics, D.B.N.P. Arts, Commerce & Science College,  
Lonavala, Pune., E-mail - ranjubala76@gmail.com

### **Abstract**

Impact of atmospheric moisture in the ozone estimation is examined with the help of different algorithms for retrieval of TOZ using GOES sounder observations. Sensitivity of ozone band with respect to temperature and humidity for ozone retrieval is calculated. Strong correlation between atmospheric temperature and ozone estimated implies that a precise knowledge of atmospheric temperature improves the ozone root mean square estimate (rsme). Percentage root mean square (rms) difference of TOZ estimates from training and testing data sets for various possible cases is approximately 0.11. Such a small value indicates the robustness of algorithms used.

Key Words: TOZ, GOES, TIROS, RTTOV.

### **1. Introduction:**

The ozone layer that resides in the earth's stratosphere acts as a natural shield that protects living beings on earth from the harmful effects of the ultraviolet radiation of the sun. A depletion of stratospheric ozone will reduce this protection that we now have, and ozone concentrations therefore need to be monitored carefully on a global scale. The variable concentration of ozone can be detected and measured with the help of satellite observations. The earliest satellite measurements of atmospheric ozone began in 1978 with the total ozone mapping spectrometer (TOMS) sent on Nimbus-7 satellite, and they continued aboard the Russian Meteor-3 satellite until December 1994. Another TOMS instrument was launched in July 1996 on the NASA Earth Probe. The total ozone amount is computed by comparing the incoming solar energy and the backscattered UV radiation measured by TOMS at six different wavelengths. Satellite measurements of stratospheric ozone have greatly helped to generate detailed maps of the global ozone distribution and resulted in startling revelations about what has come to be known as Antarctic ozone hole. On 21 April 1995, the European Space Agency (ESA) launched the Global ozone monitoring experiment (GOME) aboard the second European Remote Sensing Satellite (ERS-2). GOME is the first European passive remote sensing instrument whose primary objective is the determination of the amounts and distribution of atmospheric trace constituents. GOME is a precursor to a more comprehensive mission known as SCIAMACHY (Scanning Imaging Absorption Spectrometer for Atmospheric CHartography). SCIAMACHY was launched on the ENVISAT-1 platform in 2002 (Kelkar, Satellite meteorology).

## Preparation of $\text{GeO}_x$ Nanowires and Nanotubes by using Vapor Transport Method and their Characterization

A. S. KATKAR<sup>1,\*</sup>, Y. B. KHOLLAM<sup>2</sup>, P. N. SHELKE<sup>3</sup>

<sup>1</sup>Dr. B. N. Purandare Arts and Smt. S.G. Gupta Commerce College,  
Valvan, Lonavla 410 403, India.

<sup>2</sup>Department of Physics, Anantrao Pawar College, Pirangut, Pune 412 115, India.

<sup>3</sup>Department of Physics, Baburaoji Gholap College, Sangvi, Pune 411 027, India  
E-mail:amarkatkar@gmail.com

### Abstract

*Germanium oxide nanowires and nanotubes are synthesized by using a simple vapor transport method. The experimental conditions for the preparations of  $\text{GeO}_x$  nanowires and  $\text{GeO}_x$  nanotubes are optimized. The photoluminescence spectra of  $\text{GeO}_x$  nanowires and nanotubes in the visible region are explored. The  $\text{GeO}_x$  nanostructures have wide band gap energy and their optical properties promised interesting applications as in fabrication of optoelectronic devices. As morphology of  $\text{GeO}_x$  nanostructures can affect on physical properties, the waveguiding behaviour of germanium oxide nanowires would be interesting and useful to fabricate future optical nanodevices.*

**Keywords:** Germanium oxide; Vapor transport method; Nanowires; Nanotubes; Optical properties.

### Introduction

Self-assembled one-dimensional (1D) semiconductor nanostructures are extensively investigated as promising candidates because of their potential for enlightening fundamental concepts regarding the role of quantum confinement effects as well as for promising applications in electrical, optical, and magnetic devices <sup>[1]</sup>. Germanium and germanium oxide are of particular interest due to their unique electronic and optical properties. Especially  $\text{GeO}_x$  is a transparent conductive oxide (TCO) with a high potential in optoelectronics optical devices such as optical waveguides for integrated optical systems <sup>[2]</sup>.  $\text{GeO}_x$  is a luminescent material, and germanium oxide based glass is thought to be more refractive than the corresponding silicate glass. Germanium dioxide,  $\text{GeO}_2$ , is a blue luminescent material with optical properties which are considered of interest for opto-electronic communications, so the fabrication of  $\text{GeO}_x$  nanowires would be useful to future optical nanodevices. As in the case of other oxides, low-dimensional structures of  $\text{GeO}_x$ , such as nanowires or nanotubes <sup>[3]</sup>, are potentially useful in nanoelectronic applications or optical nanodevices.

$\text{GeO}_2$  nanowires have been prepared by Ge evaporation <sup>[4]</sup>, laser ablation <sup>[5]</sup>, thermal oxidation <sup>[6]</sup> and carbothermal reduction <sup>[7, 8]</sup>. Also  $\text{GeO}_2$  nanotubes were synthesized using a vapor transport method <sup>[3]</sup>. Doping of nanostructures aimed at influencing the electronic and optical properties has been often reported <sup>[9-12]</sup>. In particular,  $\text{GeO}_x$  has high refractive index (around 2) enabling  $\text{GeO}_2$  nanowires to act as waveguides in the visible range, and the physical properties of  $\text{GeO}_2$  nanowires may be tuned by doping with suitable impurities. The doping of rare earths (REs) and metal transition elements (Er and Eu) and metal impurities (Sn and Mn) and their optical properties have been investigated previously <sup>[13,14]</sup>. In this work,  $\text{GeO}_x$  nanowires and nanotubes, have been synthesized using a simple vapor transport method.



# Radial Variation of Axial and Radial Velocity of Blood in Stenosed Artery in the Presence of Body Accelerations

Research Article

Neeta D.Kankane<sup>1,2</sup> and N.S.Bodke<sup>2\*</sup>

1 Department of Mathematics, Maharashtra Institute of Technology, Pune, India.

2 Department of Mathematics, Dr.B.N.P.Arts, S.S.G.G.Commerce & Science College, Lonavla, Pune, India.

**Abstract:** The paper studies the flow of blood through a stenosed artery in the presence of body accelerations. The mathematical model is constructed by considering blood to be a Newtonian fluid. The artery is assumed to have axisymmetric shape. The shape of stenosis is time dependent. The present paper calculates both radial and axial velocities. The governing blood flow equations are solved using finite difference approximation numerically and radial variation of axial and radial velocities is discussed. These velocities are plotted for different times.

**Keywords:** Axial velocity, radial velocity, Body acceleration.

© JS Publication.

## 1. Introduction

One of the most serious problem related with biological fluid flow in human body is narrowing of arteries due to deposition of fatty material inside it. Blood flow in the human circulatory system depends upon the pumping action of the heart, which creates a pressure gradient throughout the system. But in many situations of day to day life such as driving a vehicle, flying in an aircraft etc. human body may be subjected to vibratory or acceleratory motion. Prolonged acceleration may cause various physical disorders like headache, increase in pulse rate etc. Hence it is important to study the pulsatile blood flow under the action of body acceleration.

Mandal P. K et al [1] studied the effect of body acceleration on unsteady pulsatile flow of non-newtonian fluid through stenosed artery. Chakravarty S. et al [2] presented non-linear mathematical model in constricted artery. They observed the blood flow in the presence of body accelerations. The paper presented the unsteady behaviour of blood treating blood as non-Newtonian fluid. The laminar pulsatile flow of blood under the influence of externally imposed body accelerations was studied by J.C.Mishra et.al [3]. They have developed the model by treating blood as a non -Newtonian fluid using biviscosity model. The governing equations are solved using finite difference technique. The mathematical model to study the characteristic of blood flowing through an arterial segment in the presence of a couple of stenoses with surface irregularities was developed by N.Mustapha et.al [4]. They have solved governing equations numerically by MAC (Marker and Cell) method in cylindrical polar coordinate system in staggered grids. Chakravarty. S, Mandal P. K [5] studied blood flow in tapered arteries in the presence of stenosis. The paper analysed the effects of tapering, arterial wall motion and the pressure

\* E-mail: [bodke.nitin@gmail.com](mailto:bodke.nitin@gmail.com)



To study the comparison of personality [Introversion -Extraversion] and verbal intelligence of students in government aided schools and corporation schools.

Vijaya K. Jagtap (JJTU Scholar)

Dr. D. J. Darekar (JJTU Guide)

## INTRODUCTION

The personality develops only and only if we focus on our internal personality along with the outer personality that is our appearance. A good personality consists of thinking ability of a person, decision making, communication skills etc. It is also important to have a good command on language. The people who have expertise mastery on language can give proper direction to the society and also can become good leaders. We should focus on the development of language in students because good language means a good personality. The way we use the language, the type of words we use, the sentence formation and the pronunciation we do, helps us to create a good image of our personality in other people's mind.

The person who uses proper and accurate language creates a good impression on other people. The quality of our language helps us to establish a good position in the society.

## OPERATIONAL DEFINITIONS

1. **Verbal intelligence** – Mastery over language, understanding the comprehension of the language, having a rich vocabulary is called verbal intelligence. People high on this ability can make a good use of the language.
2. **Personality**- An individual's unique and relatively stable pattern of behavior, thoughts and emotions [e.g. Nelson and miller 1995, Zukerman 1995] Jung postulated two basic types or attitudes of personality.
  - a) **Introversion** – is ongoing and is interested in subjective feelings and experiences.
  - b) **Extraversion** – is outgoing and is interested in people and the outside world.

## OBJECTIVES OF THE STUDY –

1. To study verbal intelligence of students with respect to type of school i.e. government aided school and corporation school.
2. To study personality [introversion and extraversion] of student with respect to type of school i.e. government aided school and corporation school.
3. To analyze verbal intelligence and personality [introversion and extraversion] of students of government aided school and corporation school.

**A study of emotional intelligence differences among students with respect to their type of school and gender from central part of Pune city**

**Dr. D. J. Darekar\***

**(JJTU Guide)**

**Asst. Prof. Vijaya. K. Jagtap\*\***

**(JJTU Scholar)**

**Introduction**

Recognition and emotion has always been focused in philosophy and later in psychological research (Naghavi and Redzuan, 2011). Since 1995 the benefits of emotional intelligence became more widely recognized and investigated with Goleman's contribution on emotional intelligence. Emotional intelligence refers to the capacity of recognizing our feelings and those of others for motivating ourselves and for managing emotions well in us and in our relationships (Goleman, 1998). The research on emotional intelligence demonstrated that most successful people were not necessarily those with high IQs but rather those with highly developed interpersonal and social skills (Cherniss et al. 2006). Researchers agree that environment has an important role in emotional intelligence and it begins at very early age of our developmental stage. The school years contribute significantly in child's development and so it does even in case of emotional intelligence. The climate of the school may differ from the type of school. The present study focuses on exploring differences in emotional intelligence among students from government schools and those from corporation schools from central Pune city. Gender difference in emotional intelligence is also investigated.

There are a few studies which have compared emotional intelligence of students from government schools and private schools. Chouhan (2014) found that emotional intelligence is higher among students from private schools as compared to students from government schools. Katoch (2013) reported emotional intelligence to be higher among students from private schools than those from government schools. The reasons were obvious that school climate and social class differences significantly contributed to higher emotional intelligence among students from

## EFFECT OF THINKING STYLES ON EMOTIONAL INTELLIGENCE

Dr. Digambar Darekar

Dr.B.N. Purandare Arts and Smt. S.G. Gupta  
Commerce and Science College Lonavala, Pune

---

---

**Abstract:**

The purpose of this study was to find out effects of various functions (Legislative, Executive, Judicial) of Thinking Styles on Emotional Intelligence of Secondary School Students. The sample comprises of 60 Male and 60 female students between the age group of 16 to 18 years. They were administered Sternberg and Wagner's Thinking styles Inventory and Emotional Intelligence Scale by Mangal and Mangal. The obtained data was analyzed by calculating M, SD and 't' value to test the significance of the hypotheses of the study. Results revealed that the functions of thinking styles have shown significant difference on emotional intelligence. Apart from this gender difference of students has also shown significant differences on emotional intelligence.

**Key Words:** Thinking Styles, Emotional Intelligence, Secondary students.

Thinking differently is a unique characteristics of a man, this fact was realized by R.J. Sternberg (1988). He defines thinking styles as an individual's preferred way of using personal abilities when dealing with life problems. As suggested by Sternberg (1997) there are 13 thinking styles that fall into five categories functions (legislative, executive, judicial styles), forms (hierarchical, monarchic, oligarchic and anarchic styles), levels (global and local styles) and scopes (internal and external styles).

The functions category includes three fundamental thinking styles namely legislative, executive and judicial thinking style (Sternberg, 1997). Legislative thinkers are self-supporting people who choose to accomplish tasks independently. This people like to create their own rules and prefer problems that are not restructured or prefabricated. Executive thinkers tend to follow established rules and systems. They like to fill in the gaps within existing structures rather than to create the structures themselves. Judicial thinkers like to evaluate rules and procedures and prefer problems in which one analyses and evaluates existing things and ideas.

Both thinking styles and emotional intelligence involves brain activities. Emotional intelligence is the ability to monitor one's own and other's emotions to actions. It enables an individuals to exhibit suitable amount of different emotions such as rage, fear, love, happiness etc. proportional to the situations and time and enables them to know about others emotion and react accordingly. It is also important as it helps to enhance self-management as people have many conflicts that arise in their head and heart when making important decisions. Hence emotional intelligence has the potential to provide a more complete understanding about the dilemma and to integrate the best thinking about the feelings and the thoughts.

Many studies have focused on the relationship between emotional intelligence and student's thinking styles. Sternberg addresses that thinking styles of women and men are different because specific styles may be encouraged and punished and men's scores in comparison with women's are higher in legislative and internal thinking styles and it is lower in judging style. Sternberg and Grigorenko (1997) investigated a research related to thinking styles and educational performance. This research shows that correlation is positive

## Significance of Rorschach obsessive style index in obsessive compulsive disorder patients

Ajay Sharma

Clinical Psychologist

Shri Auribindo Medical College & PG Institute  
Indore, Madhya Pradesh

Varun Kumar

Clinical Psychologist

Ankur Rehab Centre  
Indore, Madhya Pradesh

Digamber Jagannath Darekar

Department of Psychology Dr. B.R. Shri Purandare  
Arts & Smt. S.G. Gupta, Commerce & Science  
College Lonavla, Pune, Maharashtra

Ashok Parasar

Clinical Psychologist

District Hospital  
Jhansi, Uttar Pradesh

Obsessive Compulsive Disorder causes in many cases, severe disability. There is a dearth of reliable tools that diagnose difficult cases of Obsessive Compulsive Disorder accurately, particularly those helpful in differentiating it from schizophrenia and depression. Obsessive Style Index was developed by Exner group (1990) with the purpose of diagnosing Obsessive Compulsive Disorder patients accurately. Very little literature is available and probably none from India, regarding the validity of this index. So this research will be an attempt on this path. The aim of the study was to study the socio-demographic profile of the patients with Obsessive-Compulsive Disorder, to see the clinical profile of the patients with Obsessive-Compulsive Disorder, To see the significance of Obsessive Style Index (OBS) in diagnosing the Obsessive-Compulsive Disorder patients and To see the relation in severity of Obsessive-Compulsive Disorder on OBS index. A sample of 30 patients (male & female), diagnosed clinically as having OCD by psychiatrists on the basis of ICD-10 diagnostic criteria for research, were selected from out-patient department of the Post Graduate Institute of behavioural and Medical Sciences, Raipur (C.G.). The major thrust of the present study was to see the significance of Obsessive Style Index (OBS) in diagnosing the Obsessive-Compulsive Disorder patients and to see the relation in severity of Obsessive-Compulsive Disorder on OBS index. In essence, the present study highlights the obsessive style index (OBS) needs to be modified if it is to be used to identify the cases of obsessive compulsive disorder in our Indian population or some other measure should be used.

Keywords: obsessive, style index, obsessive compulsive disorder

The sense of well being in life is the basic requirement for the growth and proper development of one's personality. Man is not only a machine subjected to natural laws but he is also a unique, creative and somebody who can develop freely to a certain extent. The most important aim of psychology is to understand human being and his behavior, for this purpose we have to study the personality of individual. For the measurement of personality, psychologists have forwarded many techniques, which are mainly objective, and projective techniques. Both types of techniques are used widely. One of the projective techniques used for this purpose is Rorschach Inkblot Test, which was introduced by a Swiss psychiatrist, Hermann Rorschach in 1921.

Projective techniques are a product of the depth psychologists, that are those clinicians who have stressed the importance of unconscious and conscious. Projection as defined originally by Freud is defense mechanism. The ego, unable to accept itself certain thoughts, wishes or characteristics attributes these to environmental objects or to a person (Schafer & Lazarus, 1952). Since the act of projection is an unconscious mechanism, it is not communicated to others nor it is even recognized as a projection to the person himself.

Obsessive Compulsive Disorder (OCD) is represented by diverse group of symptoms that include intrusive thoughts, rituals, preoccupations and compulsions. These recurrent obsessions or compulsions cause severe distress to the person. The obsessions or compulsions are time consuming and interfere significantly with the person's normal routine, occupational functioning, usual social activities or relationships. A patient with Obsessive Compulsive Disorder may have an obsession, a compulsion or both.

The rates of obsessive compulsive are fairly consistent with life time prevalence in general population estimated at 2 to 3 percent (Sadock & Sadock, 2007).

### Aim

- To study the socio-demographic profile of the patients with Obsessive-Compulsive Disorder.
- To see the clinical profile of the patients with Obsessive-Compulsive Disorder.
- To see the significance of Obsessive Style Index (OBS) in diagnosing the Obsessive-Compulsive Disorder patients.
- To see the relation in severity of Obsessive-Compulsive Disorder on OBS index.

### Hypotheses of the study

- OBS index will be of significance in the patients with Obsessive-Compulsive Disorder.

## A study of environmental attitude between professional organic men farmers and conventional men farmers

Digambar Darekar and Deepa Naik

Department of Psychology, Savitribai Phule Pune University, Pune, Maharashtra

The purpose of this research is to identify the difference between professional organic farmers and conventional farmers on environmental attitude on 300 sample size from Pune District, Maharashtra, India. To measure environmental attitude of farmers' Taj Scale was administered. Two matched-groups design was used. The calculated  $t=8.96$ , is statistically significant at .01 level also gives statistical weight age to this finding that environmental attitude of professional organic farmers is of significantly higher magnitude as compared to conventional farmers.

**Keywords:** environmental attitude, professional organic farmers, conventional farmers

Environmental attitude is an awareness and beliefs of people and society in relation to nature, ecology and issues of the environment (Hoerberlein, 2012). In the modern world it has become increasingly evident that we are facing a global environmental crisis. Rising sea levels and core earth temperatures along with melting polar ice caps illustrates the disastrous effects of anthropogenic climate change. Environmental attitudes are fundamentally important, widely discussed, frequently measured and poorly understood.

Environmental attitudes are defined as an individual's concern for the physical environment (Katz, 1960). Sullivan, McCann, and Erikson (1997) have studied environmental attitudes of conventional and organic farmers. According to them, farmers have been characterized as people whose ties to the land have given them a deep awareness of natural cycles, appreciation for natural beauty and sense of responsibility as stewards.

This research explores the issue by comparing the attitudes and beliefs of a group of conventional farmers to those of a group of organic farmers. They found that organic farmers reported greater awareness of and appreciation for nature in their relationship with the land. Conventional farmers reported more stress in their lives. Organic farmers reported more satisfaction with their lives and a greater concern for living ethically and stronger perception of community. They found organic farmer's environmental attitude was significantly high (33%) and conventional farmers environmental attitude was significantly low (15%).

The Satoshi, Takahiro, Satomi, Takeuchi, and Nisikawa (2014) investigated research on exploring the factors affecting farmer's implementation of wildlife-friendly farming on Sado Island, Japan. All 5010 farming households on Sado Island, who are distributing rice to Japan Agricultural Cooperatives (JA), were surveyed. In total 2231 households responded to the questionnaire (response 44.5%). By comparing the attitudes, beliefs and attributes of non-certified versus certified farmers, they have identified key factors affecting farmers' implementation of WFF practices, certified farmers: 1) showed on greater interest in biodiversity and the financial benefits

of WFF. 2) Had a Barger number of certified farmer friends. 3) Felt many more pressures and expectations from consumers in particulars and 4) were not hampered by bad labour / farmland continuous when implementing WFF practices.

Fakoya, Agbonlahar, and Dipeolu, University of agriculture, Abeokuta, Nigeria (2007) studied Attitude of Women farmers towards sustainable land management practices in South Western Nigeria. The study was carried out among women farmers in Condo state, South West Nigeria. The results revealed that the mean age of the women farmers in the state was 45. 3 year, most of the farmers (about 58.77%) were married and that majority of the farmers presently cultivated personal land. Also, it was observed that most of the farm lands were inherited / family owned. Mixed cropping is the most dominant cropping system and the women were mainly farmers through about 12% of them are also involved in Off-farm processing. The correlation analysis revealed that there is a strong positive ( $r=0.63$ ;  $p<0.05$ ) correlation between the attitude score and land management practices adopted by the women farmers.

Holloway and Bery (1996) investigated farmer's attitudes towards environmental change, particularly global warming and the adjustments of crop mix and farm management. This paper concentrates on the farmer and their response on to the ideas of environmental issues and global warming, while subsequent work has examine the responses of structural agencies, including food processing companies and research organizations. They found that when considering global warming as a specific issue, however farmers recognise that changes in management may occur in response to altered environmental conditions.

Herath, Wijekoon, Idesia, and Chile (2013) studied attitudes and perceptions of organic coconut farming. The theoretical framework for the study was developed based on the theory of planned behaviour. The data were collected from 102 organic growers and 76 non-organic growers. The results showed that non organic growers did not have strange motivation to practice organic farming as they were of the view that yields are low, even through organic coconuts have a slightly higher price.

In the present research, two matched-groups design was used. Researcher has been matched Professional Organic Farmers to Conventional Farmers on the some variables, i.e., age, educational qualification, experience of the same farming method, area of

Correspondence should be sent to Dr. Digambar Darekar  
Department of Psychology  
Savitribai Phule Pune University, Pune, Maharashtra  
E-mail: vakratunda9999@gmail.com

## Study of Social Value among Violent and Non-violent Offenders

**Dr. Ramprasad S. Kale**  
Associate Professor,  
Government college of Arts and Science, Aurangabad

**Dr. Digamber Darekar**  
Associate Professor,  
Dr.B.N. Purandare Arts college, Lonavala

### Abstract:

People having high social value seek out the love of people and interesting to help others. This type of love is altruistic in nature. This study is significant for explanation, prediction, prevention, and control of criminal behavior as well as remedial measures for the same. Result of this study shows that social value is more among violent offenders than non-violent offenders. Further no significant differences were found among high age group offenders and low age group offenders in respect of social value.

### Introduction:

The offending behaviour is a matter of great concern because civilized society has paid much on the nuisance value of offenders. The present study is concerned with the age wise differences in personality factors, emotional intelligence and values among violent and non-violent male offenders. In group of violent offenders included murderers and in group of non-violent offenders included offenders, who have committed the crime in which element of violence has not been used such as property crime, economic crime, corruption, offences relating to election, false evidence and documents, property, weight and measures, shoplifter, pickpocket, theft, chain snatching, offences relating to coins and currency, drugs and medicine etc. To understand

the effect of age-group difference in committing the crime, both types of offenders are categorized as low age group (20 to 30 years) and high age group (35 to 45 years).

People having high social value seeks out the love of people and interesting to help others. This type of love is altruistic in nature. These type people are unselfish, kindheartedness, caring to others. According to S.P. Kulshrestha (1970) values are pattern of preferences or generalized attitudes with (mostly) real independent existence indicating the desirability of behaviors in terms of social, moral, aesthetic, and psychological needs (Kulshrestha, 1970).

Values guide the individual's behavioural decisions. Social value systems consist of the awareness of others' values or value systems, which can be as small as particular groups (e.g., clubs, religious organizations, and corporations) or as large as societies and cultures (Beggan & Allison, 1994; Liebrand & Dehue, 1996; Rohan, 2000).

### Significance of the study:

This study is significant for explanation, prediction, prevention, and control of criminal behavior as well as remedial measures for the same. This study will also facilitate for development of programmes, regarding rehabilitation of the prisoners.

3

## Techniques of Evaluation

**Dr. Ramprasad S. Kale**

Associate Professor,  
Government college of Arts and Science, Aurangabad

**Dr. Digamber Darekar**

Associate Professor,  
Dr.B.N. Purandare Arts college, Lonavala

### Abstract:

The Concept of evaluation is not new to us. But it is better to think and remember that it is a more content-specific concept when used in the content-cum-Methodology. In order to bring home this point, This paper brushes up initial background knowledge related to evaluation, educational objectives and domains, tools of evaluation In general and subject wise evaluation tools. It then proceeds to use of evaluation technique as per the content and enlists six steps in it. It supplies an example of content -related evaluation by way of test items, Finally, it describes the process of developing 'diagnostic tests'.

**Concepts:** Content Related Evaluation.

### Evaluation:

In the context of Content-Cum-Methodology

#### 1) Introduction:

We all are conversant with the term, 'Evaluation' and have certainly grasped its concepts. However, when we consider and use the term in the context of Content-Cum-Methodology it is more content -specific than it normally is. Before we could grasp this notion, it is significant and essential to brush up our information about the term 'Evaluation

#### 2) Definitions of the Term:

Beeby (1977) defines 'Evaluation' as the systematic collection and interpretation of evidence, leading as part of process, to a Judgment of value with a view of action.

This definition contains four factors of evaluation. They Are-

1. Systematic collection.
2. interpretation of evidence
3. Judgment of value, and
4. A view of action.

According to NCERT, "Evaluation is the systematic continuous process of determining-

1. The extent to which specified educational objectives, previously identified and defined are attained.
2. The effectiveness of the learning experiences provided in the classroom and
3. How well the goals of education have been accomplished."

In this context, the triangle developed by Tyler (1969) Becomes important because it graphically represent the essential and inherent aspect of the total educational process:

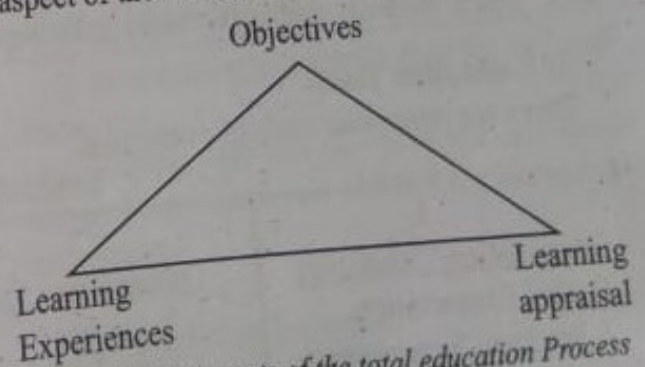


Figure No 1: Aspects of the total education Process

Briefly, it can be summarized as: what is to be accomplished → providing proper learning experiences accordingly → Verification of the extent to which pre-determined goals have been accomplished. It is clear that the

# A study of psychological well-being between professional organic farmers and conventional farmers

Digambar Darekar and Deepa Naik

Department of Psychology, Savitribai Phule Pune University, Ganeshkhind, Pune, Maharashtra

The purpose of this research is to identify the difference between professional organic farmers and conventional farmers on their psychological well-being on 300 sample size from Pune District, Maharashtra, India. To measure psychological well-being of farmers Sisodia and Choudhary scale was administered. Two matched-groups design was used. The calculated  $t=7.98$ , is statistically significant at .01 level also gives statistical weight age to these findings that psychological well-being of professional organic farmers is of significantly higher magnitude as compared to conventional farmers.

Keywords: psychological well-being, professional organic farmers, conventional farmers.

The psychological well-being is a good or satisfactory condition of existence; a state characterised by satisfaction, efficiency, sociability, mental health and good interpersonal relationships. Psychological well being can be defined as an expression of emotions and as signifying a successful adaptation to a range of demands. According to Shin and Johnson (1978), "Psychological well-being is a form of happiness as a global assessment of a person's quality of life according to his own chosen criteria".

According to Diener and Smith (1999), Psychological or subjective well-being as a construct, encompassing four specific and distinct components including (a) pleasant or positive well-being (e.g., joy, elation, happiness, mental health), (b) unpleasant affect or psychological distress (e.g., guilt, shame, sadness, anxiety, worry, anger, stress, depression), (c) life satisfaction (a global evaluation of one's life) and (d) domain or situation satisfaction (e.g., work, family, leisure, health, finance, self).

Diener (1997) has defined psychological well-being in terms of internal experience of the respondents and their own perception of their lives. Bradburn's (1969) initial understanding of psychological well-being provided a depiction of the difference between positive and negative effect.

Ryff's (1989) research has brought about a shift in focus from a subjective to an objective conception of psychological well being. Her research is theoretically and conceptually grounded on Maslow's (1968) conception of self actualization, according to him. Self actualizers' are described as showing autonomous functioning and resistance to enculturation.

Roger's (1961) view of the fully functioning person is described as having an internal locus of evaluation, whereby one does not look to others for approval but, evaluates oneself by personal standards. Jung's (1933) formulation of individualization is seen to involve a deliverance from convention, in which the person no longer clings to the collective fears, beliefs and laws of the masses and Allport's (1961) concept of maturity is seen to require participation in a significant sphere of activity outside of self. Thomas, Lewis, Salmon, Chalmers, Coleman, Kench, Capner, Sillis, and Sotfey

Correspondence should be sent to Digambar Darekar  
Associate Professor, Department of Psychology  
Savitribai Phule Pune University, Ganeshkhind, Pune, Maharashtra  
E-mail: vakratunda9999@gmail.com

(2003) studied mental health of British farmers.

## Aim of the study

Aim of this study was to estimate the prevalence of neurotic symptoms in a sample of British farmers, to investigate what farming characteristics are associated with psychiatric morbidity and to test the hypothesis that British farmers have a higher prevalence of depression and thoughts of life not work living than the British household population. Result shows that, taking a threshold of an overall score of 12 or more on the CIS-R only 6% of farmers reported clinically relevant psychiatric morbidity. Psychiatric morbidity was not significantly associated with farm type / size in these study farmers reported a lower prevalence of psychiatric morbidity than the general population. They were more likely to report thinking that life is not worth living particularly after, the low prevalence of psychiatric account (adds 2.56, 95% CI 1.39 to 4.69).

## Method

### Participants

For present research, sample had been taken from district of Pune, Maharashtra (India). In this research purposive sampling technique has been used. The sample of the present study has consists of 150 farmers, 150 professional organic farmers and 150 conventional farmers. Only male farmers are considered and their age range was between 30 to 60 years. All of them have minimum PSC qualification. Farmers have minimum three years experience of the same farming method. Farmers have farmland between 3 acres to 10 acres with annual income between 3 lakhs to 10 lakhs. Present research includes only those farmers who raise eatable crops such as grains, vegetables and fruits.

British farmers. Aim of this study was to estimate the prevalence of neurotic symptoms in a sample of British farmers, to investigate what farming characteristics are associated with psychiatric morbidity and to test the hypothesis that British farmers have a higher prevalence of depression and thoughts of life not work living than the British household population.

### Instrument

Psychological Well-being Scale (2012) by Devendra Singh Sisodia and Pooja Choudhary was administered. The scale consists of 50



## वाचनसंस्कृती आणि माहिती तंत्रज्ञान

डॉ. राजेंद्रसिंग देवरे

डॉ. वी. एन. पुरंदरे कला, श्रीमती एस. जी. गुप्ता वाणिज्य व विज्ञान महाविद्यालय, लोणावळा

विज्ञानयुगाच्या आगमनाने तंत्रज्ञान युगाचा स्वीकार केला, तंत्रज्ञान, औद्योगिकीकरण वाढत गेले. भारताची औद्योगिक क्षेत्रात प्रगती होत गेली. सध्या आपण औद्योगिकीकरणातून माहिती तंत्रज्ञान व संगणक युगात प्रवेश केला आहे. माहिती तंत्रज्ञान आणि संगणक हे या शतकाचे महत्त्वाचे घटक ठरत आहेत. या क्षेत्राने सर्व क्षेत्रांत क्रांती घडवून आणली आहे. ज्ञान सर्वासाठी खुले झाले अमून, ते सहज उपलब्ध होत आहे. या ज्ञानाच्या विस्फोटामुळे वाचनसंस्कृती, लेखनसंस्कृती, मराठी साहित्य, भाषा यांवर चांगले वाईट परिणाम होण्याची शक्यता निर्माण झाली आहे. सहज उपलब्ध होणाऱ्या ज्ञानामुळे ज्ञानाचे, शिक्षणाचे, शाळा महाविद्यालयात शिकविणाऱ्या शिक्षकांचे महत्त्व कमी होईल का? असा प्रश्न उपस्थित केला जात आहे. माहिती तंत्रज्ञानामुळे अशा अनेक समस्या निर्माण झाल्या आहेत. प्रस्तुत शोधनिबंधात 'वाचनसंस्कृती आणि माहिती तंत्रज्ञान' याविषयावर प्रकाश टाकण्याचा प्रयत्न केला आहे.

**माहिती तंत्रज्ञान :** सध्या माहिती तंत्रज्ञानाचा उपयोग सर्व क्षेत्रांत होत आहे. माहिती तंत्रज्ञानाचे महत्त्व व क्षमता लक्षात घेतली, तर ही क्रांतिकारक घटना म्हणावी लागते. या क्षेत्राचे महत्त्व मानवी जीवनाच्या सामाजिक, आर्थिक, राजकीय, शैक्षणिक आणि सांस्कृतिक अशा प्रत्येक क्षेत्रात आहे. माहिती तंत्रज्ञान हे संगणकाशी संबंधित आहे. जेव्हा संगणक इंटरनेटच्या साहाय्याने एकमेकांशी जोडले गेले, तेव्हा प्रक्रिया खूपच व्यपक आणि वेगवान बनली. हे नेटवर्किंग सर्वापर्यंत. अगदी खेड्यापाड्यातील शेतकऱ्यांपर्यंतही पोहचले. संगणकाच्या या आविष्कारामुळे या तंत्रज्ञानाला 'माहिती तंत्रज्ञान' असे म्हटले जाऊ लागले. या संदर्भात प्रा. किशोर चव्हाण, डॉ. संजीवनी महाले व डॉ. सुरेश पाटील हे 'माहिती संप्रेषण तंत्रज्ञान आणि शैक्षणिक मूल्यमापन' या ग्रंथात म्हणतात की, "संगणकात झपाट्याने झालेले बदल हे लोकांची गरज आणि संशोधनाचा परिपाक आहे. संगणक आणि विज्ञानयुगामुळे सामाजिक जीवनात क्रांती घडून आली. संगणकामुळे माहिती तंत्रज्ञान क्षेत्राचा उदय झाला. माहिती गोळा करून साठवणे, प्रक्रिया करणे आणि त्याच्यातून नवीन माहिती मिळविणे, इत्यादी वावी माहिती तंत्रज्ञानाच्या युगात महत्त्वाच्या मानल्या जातात."

माहिती तंत्रज्ञान ही अभियांत्रिकीची एक शाखा आहे. हे तंत्रज्ञान माहिती व्यवस्थापनासाठी वापरले जाते. मानवाच्या जीवनाचा प्रत्यक्षअप्रत्यक्ष संबंध या तंत्रज्ञानाशी येतो. एक प्रकारे मानवाचे जीवन या तंत्रज्ञानाशी जोडले गेले आहे. माहिती तंत्रज्ञानावर आधारित समाजरचना घडत आहे. औद्योगिकीकरणाकडून समाज माहिती तंत्रज्ञानाधिष्ठित समाजाकडे वाटचाल करत आहे. कारण, आपले ज्ञान अद्ययावत करण्यासाठी या क्षेत्राकडे आज सगळे जग लक्ष ठेवून आहे. कारण, यातील माहिती ही नेहमी अर्थपूर्ण असते. या माहितीत पूर्वज्ञानाची निश्चिती असल्याने पूर्वज्ञानात भर घालून माहिती तयार होते. अचूकपणा हा महत्त्वाचा घटक मानला जातो. बदलत्या काळानुसार माहितीत बदल केला जातो. अशा माहिती तंत्रज्ञानामुळे जगभरातल्या माणसामाणसांमध्ये संप्रेषण घडवून आणण्याचे काम तंत्रज्ञान करते. प्रत्येकाला माहितीची आवश्यकता असल्यामुळे, किंवा प्रत्येक व्यक्ती ही माहितीशिवाय जगू शकत नाही, असे म्हटले तरी वावगे ठरू नये. या संदर्भात डॉ. शारदा शेवतेकर वडवे म्हणतात, "यांत्रिकीकरणासाठी, सामाजिकीकरणासाठी, प्रत्येकालाच जीवन जगण्यासाठी माहिती आवश्यक आहे. माहिती मिळण्याचे माध्यम शब्द हे आहे. शब्दांचा वापर लेखी/तोंडी प्रकारे केला जातो. म्हणजे भाषण /माहितीचे संप्रेषण पुस्तके, मासिके, वृत्तपत्रे, मासिके पत्रे याद्वारेही होते. आधुनिक तंत्रज्ञानाच्या वापरामुळे संगणक आणि संगणक जाळे निर्माण झाले आहे. संगणकाच्या जाळ्यामुळे, नेटवर्किंगमुळे संप्रेषणाचे इलेक्ट्रॉनिक माध्यम उपलब्ध झाले आहे."

**माहिती तंत्रज्ञान आणि वाचन संस्कृती:** माहिती तंत्रज्ञानामुळे माहितीचा स्फोट झाला तसा त्याचा वाचनसंस्कृतीवर परिणाम झाला. कारण, माहिती तंत्रज्ञानात संगणकाच्या साहाय्याने वैविध्यपूर्ण माहितीचा व्यक्तिविकासासाठी उपयोग करता येऊ शकतो. सुलभपणे जगण्यासाठी ह्या माहितीचा उपयोग करता येऊ शकतो. या माहितीचे प्रसारण शाब्दिक, छापील माध्यम, इलेक्ट्रॉनिक माध्यमांच्या साहाय्याने होते. म्हणजेच एक टिकाणाहून दुसऱ्या टिकाणी ही माहिती पोहचल्याने व्यक्ती एकमेकांशी जोडल्या जातात. त्यामुळे आज वाचनसंस्कृतीतही आमूलाग बदल झाल्याचे दिसतात. पूर्वी वाचनासाठी ग्रंथविक्रेत्यांकडून पुस्तके आणून वाचावी लागत, परंतु आज संगणकाच्या साहाय्याने अनेक ग्रंथ ग्रंथालयात न जाताही सहज उपलब्ध होतात. इंटरनेटवरही वृत्तपत्रे सहज

# A STUDY OF SNAKE BITES AND PREVENTIVE MEASURES

S. S. Pokale

Department of Zoology

Dr.B.N. Purandare Arts, Smt. S.G. Gupta Commerce and Science College, Lonavala -  
410403. Maharashtra, India

(Affiliated to Savitribai Phule Pune University)

Email: - [spokale7@gmail.com](mailto:spokale7@gmail.com)

---

## Abstract: -

Snake-bite is an occupational disease of farmers, plantation workers, herdsmen, fishermen, restaurant workers and other food producers. It is therefore a healing problem that has important implications for the nutrition, economy of the countries where it occurs commonly. However, it is clear that this is an essential component of any community public health programmer. Community education about venomous snakes and snake-bite is strongly recommended as the method most likely to succeed in preventing snake bites.

This study was carried out to evaluate sufferer of snake bite in Maval and its public fitness significance. Data on sufferer of snake bites from the Primary Health Center record were utilized using a structured questionnaire designed for the study

**Keywords:** - Snake bite, Venom Maval.

## Introduction

Snakebite information is a fatal condition during tropical and sub-tropical regions in South Asia, Southeast Asia, Africa, and South America (Kasturiratne et al, 2008). Although high snakebite mortality is often reported to occur in India (Westly, 2013), the highest incidence of venomous snakebites is in Asia (162 annual deaths per 100,000 population) : southeastern Nepal (Sharma et al, 2004a). Among the 18 described type of venomous snakes in Nepal (Sharma et al, 2013), the Common Krait (*Bungarus caeruleus*) and the Common Cobra (*Naja naja*) account for the majority of morbidity and mortality (Magar et al, 2013). Case fatality ratios range from 3% to 58% (see Table 1), yet snakebite has not been a delegated as a public health issue in Nepal (Nepal Health Research Council, 2013). Published studies of snakebites in Nepal are scarce and

# DIVERSITY OF BACILLARIOPHYCEAE IN VALVAN LAKE OF MAVAL, (M.S.), INDIA.

S. S. Pokale

Department of Zoology

Dr.B.N. Purandare Arts, Smt. S.G. Gupta Commerce and Science College, Lonavala -410403.

Maharashtra, India

(Affiliated to Savitribai Phule Pune University)

Email: - [spokale7@gmail.com](mailto:spokale7@gmail.com)

---

## Abstract: -

Lakes, rivers and reservoirs are the very important water resources and used for various purposes Valvan Lake is principal fresh water body located in Valvan Tahsil, Maval Pune, Maharashtra. A study of Bacillariophyceae was undertaken during 2015-2016. This water body is utilized by local residents for washing clothes and also misused for open defecation. Siltation is also responsible for polluting the water. In Bacillariophyceae, 6 species were recorded during the study.

**Key words:** - Diversity, Bacillariophyceae, Valvan Lake.

## INTRODUCTION

Bacillariophyceae or diatoms are largely spread and occur in abundance in water. They are autotrophs but can use organic substance as nutrients. The quality of water, presence of organic matter, dissolved oxygen, pH of water and physical factors play an important role in the ecological distribution of Bacillariophyceae in water.

## MATERIAL AND METHODS

The water samples were collected from the three sites of Lake such as site A, site B, site C and site D. The samples were collected in the morning hours between 8.30 a.m to 10.30 a.m. 50 liters of water sample was filtrated through the plankton net made of bolting silk number 25 with mesh size 64 lime. The collected samples were allowed to settle down by adding Lugol's iodine. Sedimentation required 24 hours after which supernatant was removed and concentrate

4

## Study of Religious Value among Violent and Non-violent Male Offenders

Dr. Digamber Darekar

Associate Professor,

Dr.B.N. Purandare Arts college, Lonavala

### Abstract:

People having high religious value gives importance to unity or harmony. These people try to find the experience of unity through self denial and mediation. He seek out something divine in every event. They are interesting to track what is most meaningful in life, and adapt a particular life style. They are ascetic and find their own ideals in life. They pursue for to experience the world as unified whole. This study is significant for explanation, prediction, prevention, and control of criminal behavior as well as remedial measures for the same. Results of this study suggests that non-violent offenders are found more on religious value than violent offenders. High age group Offenders have been found more on religious value than low age group offenders.

### Introduction:

The offending behaviour is a matter of great concern because civilized society has paid much on the nuisance value of offenders. The present study is concerned with the age wise differences in personality factors, emotional intelligence and values among violent and non-violent male offenders. In group of violent offenders included murderers and in group of non-violent offenders included offenders, who have committed the crime in which element of violence has not

been used such as property crime, economic crime, corruption, offences relating to election, false evidence and documents, property, weight and measures, shoplifter, pickpocket, theft, chain snatching, offences relating to coins and currency, drugs and medicine etc. To understand the effect of age-group difference in committing the crime, both types of offenders are categorized as low age group (20 to 30 years) and high age group (35 to 45 years).

Values guide the individual's behavioural decisions. People having high religious value gives importance to unity or harmony. These people try to find the experience of unity through self denial and mediation. He seek out something divine in every event. They are interesting to track what is most meaningful in life, and adapt a particular life style. They are ascetic and find their own ideals in life. They pursue for to experience the world as unified whole.

According to S.P.Kulshresta (1970) values are pattern of preferences or generalized attitudes with (mostly) real independent existence indicating the desirability of behaviors in terms of social, moral, aesthetic, and psychological needs (Kulshrestha; 1970).

Sumter, M. T. (1999) examined the relationship between inmates' religion and post-release adjustment. She conducted a study on 321 male prisoner's sample, from 12 prisons throughout

## A study on School Bus Transportation and Safety of Children

**Prof. Manisha Dipak Badgujar**

Sinhgad Institute of Business Administration and computer application, Lonavala. (SIBACA)

**Dr. Geetanjali Sanjay Mali**

Dr. B. N. Purandare Arts & Smt. S G Gupta Commerce College.

### Abstract

School transportation is playing consistent and durable role in the life of children from preschool through high school. The more of yellow school buses are the most noticeable and safest method of school transportation and make up the biggest form of public transportation in India. Traveling to school, however, is a complex undertaking, not always defined by icon. Many more students travel to and from school by use of their own vehicle drive by grown-up children or youngsters than by school bus. From time to time, many schools also have their own transportation system to pick up the students from the nearest destination of their homes. Despite the strict measures taken for bus transportation and safety of children by the school authorities the accidents and safety of children are causing parent to worry on their children. In this paper the researcher has studied about the transportation facilities and safety of children on the bus. It is found that safety measures are not in place and it was suggested that school should install GPS (Global system for mobile communication) and RFID (Radio frequency identification) system in the bus so that safety of the children will be improved. It allows the parent to obtain their child's location on a real time map by the geographical coordinates which send by the kit.

**Keywords:** -Bus, children, safety, school transportation, GPS

### Introduction

In the fast and hectic world of today, regularly Parents as fit as School management are extremely a lot worried about the security and safety of our school children mainly as it come to our school bus or van journey. It takes a lot of arrangement and logistics to transportation the children to and as of the school. It is a famous fact that every single of us is a user, a provider, or is affected by school transportation at some time during our daily travels. The thousands of yellow school buses be present most visible and safest mode of school transportation and make up the largest form of public transportation in India. Travelling to school, although, is a multifaceted undertaking, not for all time defined by icons. Nevertheless many more students journey to from the school by personal vehicles operated by adults or teenagers than by school bus, contributing to traffic congestion and putting school-age children at greater risk. Teenage drivers represent the highest

VAC removed list  
574

l  
t  
s  
-

## STUDY OF MACHIAVELLIANISM TRAIT AMONG SPORTSPERSONS

Dr. D.J. Darekar,  
Head & Associate Professor,  
Department of Psychology,  
R.B. Purandare College, Lonavala

Dr. Abhimanyu Dhormare  
Head & Assistant Professor,  
Department of Psychology,  
Babuji Avhad Mahavidyalaya, Pathardi

Abstract Main purpose of this study was to compare the Machiavellian trait among individual game players and team game players, and second was to examine interaction effect between individual and team game players according to type of game (individual game and team game) and gender of player (male player & female player). A sample of 300 players (150 individual game players and 150 team game players) was selected through simple random sampling method of probability sampling. For this study Machiavellianism Scale developed by Dr. S. Raj & Dr. Manjula Gupta (1982) was used for data collection. Mean, SD, and two way ANOVA etc. statistics techniques were used for data analysis and interpreting. The findings of the results show that team game players are found more Machiavellian oriented than individual game players and the male players are found more Machiavellian oriented than female players. The results further show that no significant difference is found between the male and female individual game players and the male and female team game players in terms of their Machiavellianism. The gender difference

in Machiavellianism is not noted in both individual and team game players.

### Introduction

Games or sports play crucial role in our personality development and they are also helpful to enrich our physical and mental health. Games are superior and advanced manifestation of our culture (Alegaonkar, 2010).

Sport performance is influenced by various factors in modern sport era, such as anthropometric, biomechanical, physical, physiological, psychological, social-economical, environmental, technical etc. Personality is central factor in these psychological factors and there are huge differences among us in the ways we think, feel and behave in response to particular situations (Devon, 2000; Allport, 1987; Rotter, 1956; Bandura, 1925).

For success or failure in any sport, innate characteristics of sport persons are more important than the characteristics of that sport itself. Several psychologists believe that quality of performance and participation in sport are determined by personality (Cox, 2002; Devon, 2000).

Since 1960s, three different approaches have dominated the investigations of individual differences that is, type theories, trait theories and psychoanalytic theories (Mischel, 1984). According to Singh (2005) personality dimensions straightly and easily interpret of individual differences. According to Janda and Klenke-Hamel (1982) there are four major dimensions of personality - trait, motivation, temperament and character. Trait dimension is very vital and imperative, which includes seven dimensions, i. e. introversion-extroversion, neuroticism stability, psychoticism, information processing, internal-external control, authoritarianism, and Machiavellianism (Singh, 2005).

Sport persons on field and off field behavior is also a matter of keen interest among general public. Whether players' particular

## RESEARCH ARTICLE

# Studies on Physico-chemical analysis of Mohabala Lake near Bhadrawati, District - Chandrapur (MS), India

Mahajan VS<sup>1</sup> and Pokale SS<sup>2</sup>

<sup>1</sup>Department of Zoology, Centre for Higher Learning and Research in Zoology, Nilkanthrao Shinde Science and Arts College, Bhadrawati - 442902, Dist- Chandrapur (M.S.), India.

<sup>2</sup>Dr. B. N. Purandare Arts, Smt. S. G. Gupta Commerce & Science College Lonavla.

Email: badkhalvm@gmail.com

**Manuscript details:**

Received: 26.05.2017  
Accepted: 29.06.2017  
Published : 27.09.2017

**Editor:**

**Dr. Arvind Chavhan**

**Cite this article as:**

Mahajan VS and Pokale (2017)  
Studies on physico-chemical analysis  
of Mohabala Lake near Bhadrawati,  
District - Chandrapur (MS), India;  
*International J. of Life Sciences*, 5 (3):  
438-446.

**Copyright:** © 2017 | Author (s), This is an open access article under the terms of the Creative Commons Attribution-Non-Commercial - No Derivs License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made.

**ABSTRACT**

The Mohabala lake is principal fresh water body located within Bhadrawati tahsil in Chandrapur District of Maharashtra state. Now a day lakes are degraded by both natural and anthropogenic activities, which deteriorate their quality of lake water. Normally, lakes perform the functions directly related to their physical, chemical and biological integrity to decide quality status of water. The analysis of various physico-chemical characteristics of water quality of Mohobala lake at different sites under study viz. Site A, Site B and Site C were carried out for two years i.e. from June 2013 to May 2015 for the detection of level of pollution, physico-chemical parameters analysis like, Atmospheric temperature (°C), Water temperature (°C), Transparency (cm.), Conductivity (µmhos/cm.), pH, D.O. (mg/lit.), Free CO<sub>2</sub> (mg/lit.), Total alkalinity (mg/lit.), Phenolphthalein alkalinity (mg/lit.), Total hardness (mg/lit.), Calcium hardness (mg/lit.), Magnesium hardness (mg/lit.), Chloride (mg/lit.), B.O.D. (mg/lit.), C.O.D. (mg/lit.), Phosphate (mg/lit.), Sulphate (mg/lit.), Nitrate (mg/lit.), Total solids (mg/lit.), Total dissolved solids (mg/lit.), Total suspended solids (mg/lit.).

**Key words:** Physico-chemical, Analysis, Mohabala lake.

**INTRODUCTION**

Water is the prime requirement for the existence of life and thus it has been man's endeavor for the time immemorial to utilize the available resources. The unbridled exploitation of water for irrigation, drinking and industrial purposes has caused a drastic decline of the quality and availability of water. Lakes, rivers and reservoirs are the very important water resources and used for various purposes. Physico-chemical parameters are the important component of the aquatic system as they indicate the water quality of aquatic ecosystem. This present study was conducted at three different sites in the Mohobala lake. Monthly and Seasonal variations in the physico-chemical parameters in Mohobala lake were studied during the study period of June 2013 to May 2015. This study indicates that the lakes of central India exhibit substantial variation in their biotic and abiotic characteristics



## SYNTHESIS OF N-SUBSTITUTED PYRAZOLO PYRIMIDO PYRIMIDINES AND THEIR ANTIOXIDANT EVALUATION

Sambhaji P. Vartale<sup>1\*</sup>, Sandeep G. Sontakke<sup>2</sup> and Prashant N. Ubale<sup>1</sup>

<sup>1</sup>*P.G. Research Centre, Department of Chemistry, Yeshwant Mahavidyalaya, Nanded - 431602, (MS), India.*

<sup>2</sup>*Department of Chemistry, Dr.B.N.Purandare Arts, Smt.S.G.Gupta Commerce and Science College, Lonavala-410403 (MS), India*

*Correspondence email-id: spvartale@gmail.com*

### ABSTRACT:

A novel series of N-substituted pyrazolo pyrimido pyrimidines synthesized by treating an equimolar quantity of 3-cyano-2-methylthio-6-methyl-4,8-dioxo-9H-pyrimido[1,2-a]pyrimidine (3) with hydrazine hydrate and its different aryl and heteryl derivatives in N,N'-dimethyl formamide (DMF) and anhydrous potassium carbonate as catalyst. All the structures were confirmed on the basis of spectroscopic and physico-chemical properties. Anti-oxidant activities of newly synthesized compounds were evaluated by using DPPH free radical model.

**KEY WORDS:** Pyrimidine, DMF, potassium carbonate, antioxidant activity, DPPH.

### INTRODUCTION:

Pyrimidine is the base of life because it is interior part of nucleic acid components such as uracil, cytosine and thymine. It is also present in naturally occurring substances mainly vitamins like riboflavin and thiamine. Pyrimidine is the heterocyclic aromatic compound similar to benzene and pyridine containing two nitrogen atoms at 1 and 3 positions in the six membered rings. Pyrimidine having structurally two important isomeric forms such as pyrazine, an analog with the nitrogen atoms in positions 1 and 4 and pyridazine, an analog with the nitrogen atoms in positions 1 and 2. Pyrazolo-pyrimido-pyrimidine containing three fused heterocyclic ring in a single molecule shows remarkable biological and pharmacological properties such as antimicrobial<sup>1</sup>, antidiabetic<sup>2</sup>, anti-HIV<sup>3</sup>, antimalarial<sup>4</sup>, anticonvulsants<sup>5</sup>, antifungal<sup>6</sup>, antiviral<sup>7</sup>, anti-tumor<sup>8</sup>, antiinflammatory<sup>9</sup>. Tarik et al<sup>10</sup> reported the synthesis of pyrazolo pyrido pyrimidine by refluxing pyrazolo pyridine in formic acid. Synthesis of pyrazolo pyrido pyrimidine has been described by reacting o-aminoaldehyde with amides by Sandeep M. Bagal et al<sup>10</sup>. Sambhaji et al<sup>11</sup> reported the synthesis of 7-bromo-3-cyano-4-imino-2-methylthio-4H-pyrido[1,2-a]pyrimidines and its hydrazino derivatives. Study of reported literature reveals that not enough work has been done on the synthesis of pyrimido pyrimidine fused with hydrazine derivatives.



## Synthesis of 3-Amino-4-imino-2-N-(substituted) pyrazolo[4,5-e]-4H-pyrimido[2,3-b][1,3]benzimidazoles and their anti-oxidant activity

SANDEEP G. SONTAKKE<sup>1</sup>, PRASHANT N. UBALÉ<sup>2</sup>, SAMBHAJI P. VARTALE<sup>3\*</sup>

<sup>1</sup>Department of Chemistry, Dr.B.N.Purandare Arts, Smt.S.G.Gupta Commerce and Science College, Lonavala-410403 (MS), India.

<sup>2</sup>Department of Chemistry, Late Babasaheb Deshmukh Gortheekar College, Umri-431807, (MS), India.

<sup>3</sup>P.G. Research centre, Department of Chemistry, Yeshwant Mahavidyalaya, Nanded -431602, (MS), India.

Corresponding Author email: spvartale@gmail.com

### Abstract

*In the present manuscript we have reported the synthesis of 3-Amino-4-imino-2-N-(substituted) pyrazolo[4,5-e]-4H-pyrimido[2,3-b][1,3]benzimidazole derivatives by condensing 3-cyano-4-imino-2-methylthio-4H-pyrimido[1,2-a]benzimidazole with substituted hydrazine in DMF and anhydrous K<sub>2</sub>CO<sub>3</sub> as a catalyst. All synthesized compounds were evaluated for antioxidant and antimicrobial activities. Compounds were confirmed by using IR, Mass, <sup>1</sup>H & <sup>13</sup>C NMR spectral data.*

**Keywords:** Synthesis, benzimidazole, DMF, antioxidant, antimicrobial.

### Introduction

As one of the most commonly encountered heterocycles in medicinal chemistry is benzimidazole nucleuses and present in a large family of structures with wide pharmacological interest such as antifungal<sup>1</sup>, anticancer<sup>2</sup>, antimicrobial<sup>3</sup>, antiviral<sup>4</sup>, antibacterial<sup>5</sup>, antihistamin<sup>6</sup>, antitumor<sup>7</sup>, antiproliferative<sup>8</sup>, antineoplastic<sup>9</sup>, antituberculosis<sup>10</sup>, antimalarial<sup>11</sup>.

Wide range of this application insists us to prepare the polycyclic benzimidazole derivatives fused with pyrazolo-pyrimido heterocycles. Literature survey reveals that very little work has been carried out on the synthesis of pyrimido-benzimidazole system condensed with other heterocyclic rings such as different substituted pyrazole rings.

### Material and Methods

All the chemicals used in present works are from analytical grade and used without further purification. Melting points of the products were determined in open capillary tubes on an electrothermal melting point apparatus and were uncorrected. All these reactions were monitored by thin. IR spectra were recorded on Shimadzu FT-IR spectrophotometer, <sup>1</sup>HNMR spectra were obtained on Bruker avance spectrophotometer 500 MHz in DMSO-d<sub>6</sub> using TMS as an internal standard. Mass spectrums were analyzed on GC-MS spectrometer using the ESI technique.

## One pot Synthesis of 4-amino-6-(methylthio)-2-phenylpyrimidine-5-carbonitrile and its 6-substituted derivatives with evaluation of their antioxidant activity

D.S. KAWALE, S.P. VARTALE\* AND S.G. SONTAKKE

PG Research Center, Department Of Chemistry, Yeshwant Mahavidyalaya Nanded-431602 (MS) India  
Corresponding Author email: spvartale@gmail.com

### Abstract

*Synthesis of novel heterocyclic 4-amino-6-(methylthio)-2-phenylpyrimidine-5-carbonitrile (3) was prepared by condensing benzamidine hydrochloride (1) with bis(methylthio)methylene malononitrile (2) in DMF and potassium carbonate as catalyst. Compound (3) has methylthio group at sixth position, which is replaced by different nucleophiles such as substituted anilines, phenols, hetryl amines and compounds containing active methylene group to afford 6-substituted derivatives of compound (3). The newly synthesized compounds were characterized by IR, <sup>1</sup>H-NMR, Mass spectral analysis. Furthermore, these synthesized compounds were tested for antioxidant activity. The result of antioxidant activity reveals that most of the compounds shows potent activity. The major advantage of this protocol is operational simplicity and high yield.*

**Keywords:** Benzamidine hydrochloride, Bis(methylthio)methylene Malononitrile, DMF, Potassium Carbonate and Pyrimidines.

### Introduction

The chemistry of the heterocyclic compounds is the most important in the discovery of new drugs. Heterocyclic system linked to pyrimidine ring system are of great interest because they constitute an important class of natural products and has been recognised as to be rich source of bioactive metabolites with varied biological and pharmacological activities<sup>1-2</sup>. The incorporation of heteroatom or heterocyclic ring to a steroidal moiety not only affects the chemical properties but also alters its pharmacological activities. For example, heterosteroids such as finasteride is a 5 $\alpha$ -reductase inhibitor<sup>3</sup>, abiraterone an anticancer drug<sup>4</sup>. The potent biological activity of various vitamins and drugs<sup>5-6</sup> is primarily attributed to the presence of pyrimidine ring in their molecular architect. Pyrimidine and its derivatives are the important class of heterocyclic compounds in the pharmaceutical industry as well as in synthetic chemistry<sup>7</sup>. On the other hand pyrimidine is a important heterocyclic unit that form the core of a large family of nucleic acids and natural products with strong bioactivity profiles and significant structural properties<sup>8</sup>.

Pyrimidine being an integral part of nucleic acids<sup>9</sup>. Therefore substituted pyrimidine exhibit diverse pharmacological activities such as antifilarial<sup>10</sup>, anticancer<sup>11</sup>, antibacterial<sup>12</sup>, antimycotic<sup>13</sup>, cardiotoxic<sup>14</sup>, diuretic<sup>15</sup>, antimalarial<sup>16</sup>, anticonvulsant<sup>17</sup>, and anti-inflammatory. Numerous pyrimidine derivatives are well known drugs for variety of diseases. Literature survey reveals that compounds containing pyrido-pyrimidine have wide range of biological activities such as herbicidal<sup>18</sup>, antitumor<sup>19</sup>,

## Synthesis and Antimicrobial Evaluation of Substituted Pyrimido-Pyrimidine and its Derivatives

PRASHANT N. UBALE<sup>1</sup>, SANDEEP G. SONTAKKE<sup>2</sup>, SAMBHAJI P. VARTALE<sup>3\*</sup>

<sup>1</sup>Department of Chemistry, Late Babasaheb Deshmukh Gortheekar College, Umri-431807, (MS), India.

<sup>2</sup>Department of Chemistry, Dr.B.N.Purandare Arts, Smt.S.G.Gupta Commerce and Science College, Lonavala-410403 (MS), India.

<sup>3</sup>P.G. Research centre, Department of Chemistry, Yeshwant Mahavidyalaya, Nanded -431602, (MS), India.

Corresponding author E-mail: spvartale@gmail.com

### Abstract

We synthesized the novel substituted pyrimido-pyrimidine and their derivatives by treating an equimolar amount of 2-amino-4-methyl pyrimidine (1) with ethyl 2-cyano-3,3-bis(methylthio)acrylate in *N,N'*-dimethyl formamide (DMF) and catalytic amount of anhydrous potassium carbonate. Then synthesized substituted pyrimido-pyrimidine reacted with different *N*- and *O*-containing nucleophiles such as substituted aromatic amines and phenols to give 2-substituted derivatives of pyrimido-pyrimidines. Structures of compounds confirmed on the basis of spectroscopic techniques (IR, Mass, <sup>1</sup>H NMR) and physico-chemical data. Antimicrobial activities of newly synthesized compounds were evaluated by using disc diffusion method.

**Keywords:** Pyrimido-pyrimidine, DMF, Potassium carbonate, antimicrobial evaluation.

### Introduction

Pyrimido-pyrimidines are the fused heterocyclic compounds in which one N-atom is present at bridged position. Substituted derivatives of pyrimido-pyrimidines are found to be active biological agents in nature. Substituted bis(diethylamino) pyrimido[5,4-d]pyrimidine diethanol act as the sympathetic cardiovascular center stimulant agent<sup>1</sup>. 6-substituted 4-anilinopyrimido[5,4-d]pyrimidines shows the potent activity of tyrosine kinase inhibitor<sup>2</sup>. Some pyrimido-pyrimidine derivatives (RX-RA69 and RX-RA85) shows the potential antitumor activities<sup>3</sup>. J.L. Ambrus studied the hemorrheologic effect of some pyrimido-pyrimidine derivatives<sup>4</sup>. J. Bedi et al studied effect of pyrimido-pyrimidine on blood coagulation and platelet aggregation<sup>5</sup>.

Despite of all these pharmacological activity, different derivatives of pyrimido pyrimidine also shows antiviral activity<sup>6</sup> antioxidant activity<sup>7</sup> antifungal activity<sup>8</sup>, hepatoprotective activity<sup>9</sup> antitumor activity<sup>10</sup>, antimicrobial activity<sup>11</sup> and antifungal activity<sup>12</sup>. This type of precious activity of pyrimido pyrimidines, we are interested to prepare different derivatives of pyrimido pyrimidines.

## Synthesis and Characterization of Fine Powdered Cu-Doped ZnO and their Catalytic Application for Ultrasound-Mediated Synthesis of Substituted Benzimidazole and their Antimicrobial Activity

M.C.NAGTILAK<sup>1</sup>, S.N. LABADE<sup>1</sup>, S. S. SAWANT<sup>2\*</sup>

<sup>1</sup>D. B. N. P Arts, S. S. G. G. Commerce and Science College, Lonavavla-410403

<sup>2</sup>S. M. Joshi College, Pune - 411028

\*Corresponding Author e-mail: sssspj@rediffmail.com

### Abstract

*One-pot simpler multistep reactions involving a new synthetic greener route and novel, efficient, reusable, cheaper and eco-friendly catalytic procedure have been discovered for the synthesis of variously substituted benzimidazole. The reaction of 1,2 diamine and substituted aldehyde in dichloromethane under ultrasonic irradiation at ambient temperature using Cu-doped ZnO furnish the expected product in excellent yield (87-98 %) in considerably reduced time (15-30 min). Spectral data and Physical constant confirmed the formation of the preferred product. Synthesized substituted benzimidazoles were also screened for antimicrobial activity and found significantly active against various gram positive and gram negative bacteria and some fungus. The main advantages of this research are mild reaction conditions, short reaction times, high yield, greener route, cheap, inexpensive, non-toxicity, and reusability of the catalyst.*

**Keywords:** Cu-doped Zinc Oxide Catalyst, Benzimidazole, O-Phenylene Diamine, Aromatic Aldehydes, Green Synthesis, Ultrasonication, Antimicrobial Activity.

### Introduction

Benzimidazole is the important nucleus of most of the natural products and pharmacologically active compounds[1]. Structures containing substituted benzimidazole derivatives have a large number of pharmaceutical and biological application such as anticancer, antifungals, antiulcer agents, antihypertensives, antivirals, and antihistaminics in veterinary medicine [2–5]. For example, substituted benzimidazoles are present in antiparasite drug albendazole, proton pump inhibitor drug lansoprazole, antihypertensive drug telmisartan and receptor antagonist drug astemizole[6–9].

Substituted benzimidazoles having interesting pharmacological properties, great concentration has been given to their synthesis. Various synthetic routes were mentioned in literature[10-24]. On the other hand, ultrasound is an attractive powerful technique used in increasing the reaction rates, accelerating dissolution and regenerating the surface of the catalyst in a most of the reaction[25]. Most of the organic synthesis reactions can be carried out under Ultrasound irradiation[26-38]. A simple experimental procedure, milder condition, shorter reaction time, high yields of the product, minimum energy requirement, facile manipulation, waste minimization, avoidance of toxic chemicals, increasing reaction efficiency and selectivity are the notable features of the ultrasound promoted organic synthesis which makes it more superior than the traditional methods.

## Synthesis and Characterization of Fine Powdered Cu-Doped ZnO and their Catalytic Application for Ultrasound-Mediated Synthesis of Substituted Benzimidazole and their Antimicrobial Activity

M.C.NAGTILAK<sup>1</sup>, S.N. LABADE<sup>1</sup>, S. S. SAWANT<sup>2\*</sup>

<sup>1</sup>D. B. N. P Arts, S. S. G. G. Commerce and Science College, Lonavavla-410403

<sup>2</sup>S. M. Joshi College, Pune - 411028

\*Corresponding Author e-mail: sssspj@rediffmail.com

### Abstract

*One-pot simpler multistep reactions involving a new synthetic greener route and novel, efficient, reusable, cheaper and eco-friendly catalytic procedure have been discovered for the synthesis of variously substituted benzimidazole. The reaction of 1,2 diamine and substituted aldehyde in dichloromethane under ultrasonic irradiation at ambient temperature using Cu-doped ZnO furnish the expected product in excellent yield (87-98 %) in considerably reduced time (15-30 min). Spectral data and Physical constant confirmed the formation of the preferred product. Synthesized substituted benzimidazoles were also screened for antimicrobial activity and found significantly active against various gram positive and gram negative bacteria and some fungus. The main advantages of this research are mild reaction conditions, short reaction times, high yield, greener route, cheap, inexpensive, non-toxicity, and reusability of the catalyst.*

**Keywords:** Cu-doped Zinc Oxide Catalyst, Benzimidazole, O-Phenylene Diamine, Aromatic Aldehydes, Green Synthesis, Ultrasonication, Antimicrobial Activity.

### Introduction

Benzimidazole is the important nucleus of most of the natural products and pharmacologically active compounds[1]. Structures containing substituted benzimidazole derivatives have a large number of pharmaceutical and biological application such as anticancer, antifungals, antiulcer agents, antihypertensives, antivirals, and antihistaminics in veterinary medicine [2–5]. For example, substituted benzimidazoles are present in antiparasite drug albendazole, proton pump inhibitor drug lansoprazole, antihypertensive drug telmisartan and receptor antagonist drug astemizole[6–9].

Substituted benzimidazoles having interesting pharmacological properties, great concentration has been given to their synthesis. Various synthetic routes were mentioned in literature[10-24]. On the other hand, ultrasound is an attractive powerful technique used in increasing the reaction rates, accelerating dissolution and regenerating the surface of the catalyst in a most of the reaction[25]. Most of the organic synthesis reactions can be carried out under Ultrasound irradiation[26-38]. A simple experimental procedure, milder condition, shorter reaction time, high yields of the product, minimum energy requirement, facile manipulation, waste minimization, avoidance of toxic chemicals, increasing reaction efficiency and selectivity are the notable features of the ultrasound promoted organic synthesis which makes it more superior than the traditional methods.

# Room-temperature ferromagnetic Cr-doped Ge/GeO<sub>x</sub> core–shell nanowires

Amar S Katkar<sup>1,5</sup>, Shobhnath P Gupta<sup>2</sup>, Md Motin Seikh<sup>3</sup>,  
Lih-Juann Chen<sup>4</sup> and Pravin S Walke<sup>2,5</sup> 

<sup>1</sup> Dr. B N Purandare Arts and Smt. S G Gupta Commerce and Science College, Valvan, Lonavla, Pune-410403, India

<sup>2</sup> National Centre for Nanosciences and Nanotechnology, University of Mumbai, Kalina Campus, Santacruz (E), Mumbai-400098, India

<sup>3</sup> Department of Chemistry, Visva-Bharati University, Santiniketan, West Bengal-731235, India

<sup>4</sup> Department of Materials Science and Engineering, National Tsing Hua University, Hsinchu, Taiwan, Republic of China

E-mail: amarisnow@gmail.com, shivshripsw@gmail.com and pravin.w@nano.mu.ac.in

Received 5 January 2018, revised 6 March 2018

Accepted for publication 19 March 2018

Published 11 April 2018



CrossMark

## Abstract

The Cr-doped tunable thickness core–shell Ge/GeO<sub>x</sub> nanowires (NWs) were synthesized and characterized using x-ray diffraction, field-emission scanning electron microscopy, transmission electron microscopy, energy-dispersive x-ray spectroscopy, x-ray photoelectron spectroscopy and magnetization studies. The shell thickness increases with the increase in synthesis temperature. The presence of metallic Cr and Cr<sup>3+</sup> in core–shell structure was confirmed from XPS study. The magnetic property is highly sensitive to the core–shell thickness and intriguing room temperature ferromagnetism is realized only in core–shell NWs. The magnetization decreases with an increase in shell thickness and practically ceases to exist when there is no core. These NWs show remarkably high Curie temperature ( $T_C > 300$  K) with the dominating values of its magnetic remanence ( $M_R$ ) and coercivity ( $H_C$ ) compared to germanium dilute magnetic semiconductor nanomaterials. We believe that our finding on these Cr-doped Ge/GeO<sub>x</sub> core–shell NWs has the potential to be used as a hard magnet for future spintronic devices, owing to their higher characteristic values of ferromagnetic ordering.

Keywords: Ge nanostructures, core–shell, ferromagnetism, Curie temperature, dilute magnetic semiconductor

(Some figures may appear in colour only in the online journal)

## 1. Introduction

Modern electronics relies greatly on smart and engineered semiconductor nanostructures such as dilute magnetic semiconductors (DMSs), especially for next-generation high-speed digital circuits. Dilute ferromagnetic semiconductors, prepared by substituting magnetic ions into nonmagnetic semiconductors [1, 2], have recently attracted great interest due to their potential to create new classes of spin-dependent electronic devices. However, complete understanding of the fundamentals of magnetism in such a system is still a long way off, which is

explained in terms of the isolation of metallic clusters [3], as the double exchange phenomenon has been accepted in transition metal (TM)-based systems containing different oxidation states [4]. In the case of TM-doped semiconducting oxides [5–7], the magnetic properties are strongly associated to the defects and/or rearrangement of the electronic configuration rather than the availability of magnetic ions. Therefore, in order to satisfy growing industrial need, DMSs need to have a high Curie temperature ( $T_C$ ) and should be compatible with the existing conventional silicon technology. There is the need to investigate possible materials with intrinsic ferromagnetism having  $T_C$  preferably above room temperature for high-speed spintronic devices [8]. It is always challenging to prepare room

<sup>5</sup> Authors to whom any correspondence should be addressed.



## Biological Synthesis of Cu<sub>2</sub>O Nanoshells and its Optical Properties

PAMOD V. SHELAR<sup>1</sup>, AMAR S. KATKAR<sup>2\*</sup>

<sup>1</sup>Haribhai.V.Desai College, Pune-411002, India.

<sup>2</sup>Dr. B. N. Purandare Arts and Smt. S. G. Gupta Commerce and Science College, Valvan, Lonavla, Pune, India

\*Corresponding author E-mail: amarkatkar@gmail.com

Received: 26.03.2018

Accepted: 23.04.2018

Published Online 15.06.2018

<https://doi.org/10.30731/ijcps.7.3.2018.75-80>

### ABSTRACT

Using extract of fruits of pomegranate (*Punica Granatum L.*), the bulk amount of Cu<sub>2</sub>O Nanoshells was synthesized rapidly with a very simple method. The as prepared sample was characterized by FESEM, TEM, UV-VIS spectroscopy and FTIR. The UV-VIS spectra and FTIR spectra confirmed the stability of Cu<sub>2</sub>O nanoshells at room temperature even after longer time. Further the optical properties of Cu<sub>2</sub>O nanoshells was investigated by using Photo Luminescence Spectra, which shows broad intense green luminescence. The fast growth of bulk amount of Cu<sub>2</sub>O nanoshells was successfully achieved by optimizing the experimental conditions.

**KEYWORDS:** Cu<sub>2</sub>O nanoparticles, Biological synthesis, nanoshells, Pomegranate extract, Cu<sub>2</sub>O nanoparticles

### INTRODUCTION

From last decade, it is required to synthesize nanostructures with controlled manner and with simple method in bulk amount, so that it can be utilized in industry to fabricate optoelectronic devices in large scale. The P-type semiconductor material such as Copper oxide (Cu<sub>2</sub>O) has gained profound interest due to its unique optical, magnetic and chemical properties [1-4]. The Cuprous oxide (Cu<sub>2</sub>O) is p-type semiconductor material having direct bandgap of 2.2. eV. It is efficient solar light absorber and so provides the feasibility to build heterojunction solar cells with n-type materials such as TiO<sub>2</sub>, ZnO etc.[5-6] The biological applications such as antibacterial activity of Cu<sub>2</sub>O nanoparticles was also demonstrated successfully [7-9]. Due to its electrical and optical properties Cu<sub>2</sub>O can be utilized for various other applications like solar cells, gas sensing, , magnetic resonance imaging (MRI) contrast agents, superconductor and battery applications (Lithium ion batteries) [10-15]. Recently, biosynthesis of nanoparticles has attracted attention because of the necessity to develop new clean, cost-effective and efficient synthesis techniques. The biosynthesis of Cu<sub>2</sub>O nanoparticles has been carried out using brown algae (*Bifurcaria bifurcate*), *Tridax procumbens* leaf extract, Goose Berry (*Phyllanthus Embilica*) extract, *Morganella psychrotolerans* and extract of *E-coli* and via reverse micelles microemulsion [16-19].

In this paper the simple and fast method of biosynthesis of Cu<sub>2</sub>O nanoshells has been discussed using extract of fruits of pomegranate (*Punica Granatum L.*). The optical properties of the Cu<sub>2</sub>O nanoshells was investigated using UV-VIS spectra, FTIR spectra and Photoluminescence spectra. The as synthesized Cu<sub>2</sub>O nanoshells would be potential candidate for using it for various industrial applications.

## THE STUDY OF RADIAL VELOCITY OF BLOOD THROUGH STENOSED ARTERY AND SHAPE FUNCTION

N.D.Kankane and N.S.Bodke

Communicated by Ayman Badawi

MSC 2010 Classifications: Primary 20M99, 13F10; Secondary 13A15, 13M05.

Key words: Overlapping stenosis, Radial velocity, Finite difference method.

**Abstract.** The blood flow characteristics through an artery in the presence of overlapping stenosis is studied mathematically. The artery is assumed to have an axisymmetric shape. The arterial wall deformability is taken to be elastic (moving wall). In the present study, Radial variation of radial velocity is studied. The shape function distribution over the length of the artery is also studied. The blood is treated as Newtonian fluid and the arterial wall is treated to be elastic having stenosis in its lumen which is due to deposition of fatty material. The equations of motion are solved numerically by finite difference scheme. The present results show consistency with the available results.

### Introduction

Cardiovascular disease is the most common problems related to biological fluid flow in the human body. Circulatory disorders are known to be responsible for over seventy five percent of all deaths and stenosis or atherosclerosis is one of the oftenly occurring cardiovascular diseases. Stenosis is narrowing of a body passage, tube or orifice [1]. It is an abnormal growth that develops at different locations of the cardiovascular system. It is due to deposition of fatty material inside the artery. In the region of narrowing arterial constriction, the flow accelerates and consequently velocity gradient near the wall is steeper due to increased core velocity resulting in relatively large shear stress on the wall. The properties of blood and arterial wall motion play a vital role in physiology of cardiovascular system. Thus we should understand the factor controlling blood flow in the presence of stenosis.

A large number of researchers have contributed in studying blood flow in the presence of stenosis. Haldar. K [2] has studied resistance to blood flow through an artery due to shape function. The paper investigated that the resistance to flow decreases as the shape of stenosis changes. They have considered the flow to be steady state one dimensional. The fluid dynamic variables were numerically analysed in human carotid artery bifurcation model by Perktold. K [3] et.al. They clarify the geometric factor in carotid bifurcation atherogenesis. The governing Navier-Stokes equations describing incompressible, pulsatile, three dimensional viscous flows are approximated using a pressure correction finite element procedure which has been developed for three-dimensional, time-dependent viscous flow problems. Chakravarty. S and Mandal. P. K [4] studied blood flow in overlapping arterial stenosis. The paper presented the unsteady behaviour of blood treating blood as non-Newtonian fluid. Sannigrahi. A. [5] observed the blood flow in the presence of body accelerations. Chakravarty. S, Mandal P. K [6] studied blood flow in tapered arteries in the presence of stenosis. The paper analysed the effects of tapering, arterial wall motion and the pressure gradient on the blood flow characteristic. Yakhot. A et.al [7] have studied a pulsatile flow of a viscous, incompressible fluid through a stenosed artery and explored the influence of the shape and surface roughness on the flow resistance. Ruchi Agarwal [8] studied pulsatile blood flow in carotid artery bifurcation. The paper studied the flow at various locations in common carotid artery and internal carotid artery for different frequencies 60, 90, 120 pulse/min. N. Mustapha et.al [9] simulated unsteady blood flow through multi-irregular arterial stenosis. They have used marker and cell method to study blood characteristic with surface irregularities. Daniel Riahi et.al [10] have considered the blood flow in an artery in the presence





## Effect of Temperature Variation in Synthesis of CuInS<sub>2</sub> Thin Films Using Ultrasonic Spray Pyrolysis (USP)

P. P. Atre<sup>a</sup>, M. A. Desai<sup>b</sup>, S. D. Sartale<sup>b</sup> and B. N. Pawar<sup>a,\*</sup>

<sup>a</sup> Department of Physics, Yashwantrao Mohite College, Bharati Vidyapeeth University, Pune 411 038, India.

<sup>b</sup> Thin films and Nano-materials Laboratory Department of Physics, Savitribai Phule Pune University, Pune 411 007, India.

**Abstract:** We report as deposited good quality CuInS<sub>2</sub> thin films synthesized at various deposition temperatures using ultrasonic spray pyrolysis (USP). CuInS<sub>2</sub> plays an important role in solar cell as an absorber layer. Deposition temperature is one of the most important parameter in spray pyrolysis system. Hence, we studied the effect of deposition temperature on CuInS<sub>2</sub> thin films using advanced spray called USP. Ultrasonication in spray system gives rise to very fine droplets. The initial precursor ratios of molarities of Cu : In : S were kept as 0.06 : 0.06 : 1, respectively. Due to tiny particles sprayed uniformly over glass substrate with high adhesion gives rise, to formation of pristine tetragonal CuInS<sub>2</sub>. As deposited thin films were characterized by X-ray diffraction (XRD), Raman spectroscopy, Scanning electron microscope (SEM) and Energy dispersive spectroscopy (EDS).

**Keywords:** Copper indium disulphide, ultrasonic spray pyrolysis, solar cells.

### Introduction:

The ternary chalcopyrite compound I-III-VI semiconductors in thin-film solar cells as an absorber material are mostly attractive due to their high optical absorption and good stability at room temperature. Copper indium disulphide (CuInS<sub>2</sub>) is one of the most promising candidates for absorption of light over visible spectrum due to its direct band gap (~1.5 eV) and absorption coefficient of 10<sup>5</sup> cm<sup>-1</sup>. CuInS<sub>2</sub> has great potential of generation of photovoltaic in high efficiency solar cell.[1-3]

CuInS<sub>2</sub> is obtained in both n-type and p-type semiconductor form which depends upon the chemical composition of copper and indium i.e. ratio of Cu/In. When thin film is indium rich, it shows n-type nature, while if it is copper rich it acts as a p-type material. However, for absorption layer in solar cells, p-type CuInS<sub>2</sub> is preferred. Solar cells of efficiencies more than 13% have been achieved with CdS as a buffer layer and around 10% with help of In<sub>2</sub>S<sub>3</sub> as a buffer layer.[4-7]

CuInS<sub>2</sub> thin films can be deposited with several techniques such as sputtering, chemical bath deposition (CBD), chemical vapour deposition (CVD), spray pyrolysis, etc. Among these, spray pyrolysis is an attractive method for large area thin film production with low cost and easy to

process.[8-10] However, uneven droplet size gives rise to defects and trap levels, which affect the efficiency of solar cell, also bigger droplets of aerosol crash into the film surface, deteriorating film morphology. Hence, the challenge for researches is to obtain homogeneous, compact and uniform thin films for solar cell application. As technology has progressed, lot of changes has been introduced to obtain better quality thin films. Ultrasonic Spray Pyrolysis (USP) system is one of them. It is advanced version of spray pyrolysis system in which high frequency is applied to nozzle. USP generates even, ultra-fine droplets of few microns size which ensures good crystallites and homogeneous thin films.[11-13]

In the present work, USP system was used to deposit CuInS<sub>2</sub>. To obtain good quality thin film using spray system, various process parameters are used. Temperature is one of the important factor in the deposition of thin film. Hence, in this study substrate temperature varied from 200 - 350°C to study effect of temperature on CuInS<sub>2</sub> thin film.

### Experimental:

All chemicals were of Sigma Aldrich (99.99%) and used without any further purification. Copper chloride (CuCl<sub>2</sub>), Indium chloride (InCl<sub>3</sub>) and thiourea (NH<sub>2</sub>CSNH<sub>2</sub>) were used as initial precursors for copper, indium and sulphur respectively. The solutions were prepared in double distilled water. Cu/In ratio was kept constant for 1 i.e. 0.06 M, while Cu/S ratio kept constant to 5 i.e. 0.3 M. This solution was stirred for 15 minutes using sonicator. Solution was applied through syringe pump, which controls the flow rate, to Sono-Tek nozzle of frequency 120 kHz generator. Glass substrates were used for deposition of CuInS<sub>2</sub> thin films. Clean and impurity free substrate is essential for deposition. Therefore before deposition, glass substrates were cleaned with distilled water, detergent solution, piranha solution and finally kept in ultrasonic bath.

Total 30 ml precursor solution was sprayed on glass substrate preheated for different temperatures ranging from 200 to 350°C. With the help of air compressor the flow rate was kept at 5 litre/min. The air acted as carrier gas for droplets to reach the substrate. Solution flow rate was kept at



## One pot Synthesis of 4-amino-6-(methylthio)-2-phenylpyrimidine-5-carbonitrile and its 6-substituted derivatives with evaluation of their antioxidant activity

D.S. KAWALE, S.P. VARTALE\* AND S.G. SONTAKKE

PG Research Center, Department Of Chemistry, Yeshwant Mahavidyalaya Nanded-431602 (MS) India  
Corresponding Author email: spvartale@gmail.com

### Abstract

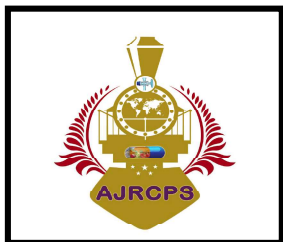
*Synthesis of novel heterocyclic 4-amino-6-(methylthio)-2-phenylpyrimidine-5-carbonitrile (3) was prepared by condensing benzamidine hydrochloride (1) with bis(methylthio)methylene malononitrile (2) in DMF and potassium carbonate as catalyst. Compound (3) has methylthio group at sixth position, which is replaced by different nucleophiles such as substituted anilines, phenols, hetryl amines and compounds containing active methylene group to afford 6-substituted derivatives of compound (3). The newly synthesized compounds were characterized by IR, <sup>1</sup>H-NMR, Mass spectral analysis. Furthermore, these synthesized compounds were tested for antioxidant activity. The result of antioxidant activity reveals that most of the compounds shows potent activity. The major advantage of this protocol is operational simplicity and high yield.*

**Keywords:** Benzamidine hydrochloride, Bis(methylthio)methylene Malononitrile, DMF, Potassium Carbonate and Pyrimidines.

### Introduction

The chemistry of the heterocyclic compounds is the most important in the discovery of new drugs. Heterocyclic system linked to pyrimidine ring system are of great interest because they constitute an important class of natural products and has been recognised as to be rich source of bioactive metabolites with varied biological and pharmacological activities<sup>1-2</sup>. The incorporation of heteroatom or heterocyclic ring to a steroidal moiety not only affects the chemical properties but also alters its pharmacological activities. For example, heterosteroids such as finasteride is a 5 $\alpha$ -reductase inhibitor<sup>3</sup>, abiraterone an anticancer drug<sup>4</sup>. The potent biological activity of various vitamins and drugs<sup>5-6</sup> is primarily attributed to the presence of pyrimidine ring in their molecular architect. Pyrimidine and its derivatives are the important class of heterocyclic compounds in the pharmaceutical industry as well as in synthetic chemistry<sup>7</sup>. On the other hand pyrimidine is a important heterocyclic unit that form the core of a large family of nucleic acids and natural products with strong bioactivity profiles and significant structural properties<sup>8</sup>.

Pyrimidine being an integral part of nucleic acids<sup>9</sup>. Therefore substituted pyrimidine exhibit diverse pharmacological activities such as antifilarial<sup>10</sup>, anticancer<sup>11</sup>, antibacterial<sup>12</sup>, antimycotic<sup>13</sup>, cardiotoxic<sup>14</sup>, diuretic<sup>15</sup>, antimalarial<sup>16</sup>, anticonvulsant<sup>17</sup>, and anti-inflammatory. Numerous pyrimidine derivatives are well known drugs for variety of diseases. Literature survey reveals that compounds containing pyrido-pyrimidine have wide range of biological activities such as herbicidal<sup>18</sup>, antitumor<sup>19</sup>,



# Asian Journal of Research in Chemistry and Pharmaceutical Sciences

Journal home page: [www.ajrcps.com](http://www.ajrcps.com)



## SYNTHESIS OF BENZIMIDAZOLO PYRIMIDO PYRIMIDO BENZOTHIAZOLE DERIVATIVES AND STUDY OF THEIR PHARMACEUTICAL IMPORTANCE

Sambhaji P. Vartale<sup>\*1</sup>, Prashant N. Ubale<sup>1</sup>, Datta S. Kawale<sup>1</sup>, Sandeep G. Sontakke<sup>2</sup>

<sup>1\*</sup>Department of Chemistry, Yeshwant Mahavidyalaya, Nanded, Maharashtra, India.

<sup>2</sup>Department of Chemistry, Dr. B. N. Purandare Arts and Smt.S.G.Gupta Commerce and Science College, Lonavala, Maharashtra, India.

### ABSTRACT

A mixture of 3-cyano-2-methylthio-4-oxo-4*H*-pyrimido [1, 2-*a*] benzimidazole was condensed with different substituted benzothiazole in presence of catalytic amount of anhydrous potassium carbonate and *N, N'*- dimethyl formamide as a reaction solvent, to get corresponding 6-imino-7-oxo-benzimidazolo [2, 3-*b*] pyrimido [5, 6-*e*]pyrimido [2, 3-*b*][1, 3] benzothiazole and their substituted derivatives. All the products were confirmed by their IR, <sup>1</sup>H NMR and mass spectroscopic measurements. All this compounds were screened for their antimicrobial and antioxidant activity.

### KEYWORDS

Benzothiazole, Pyrimido, Antioxidant activity and Spectroscopic measurements.

### Author for Correspondence:

Sambhaji P. Vartale,  
Department of Chemistry,  
Yeshwant Mahavidyalaya,  
Nanded, Maharashtra, India.

**Email:** [spvartale@gmail.com](mailto:spvartale@gmail.com)

### INTRODUCTON

The bridged heterocyclic compounds which contains nitrogen and sulphur is present in bridged position has a wide scope in medicine. The fused benzimidazole, benzothiazole, pyrimido benzothiazoles are one of the compounds which contain bridged nitrogen atom. Benzimidazoles and benzothiazoles are structural analogues. Both benzimidazoles and benzothiazoles are biological interesting nucleus. These moieties are present in many medicinal drugs.

Organic chemists are very much interested in synthesis of fused benzimidazoles, pyrimidines and benzothiazoles which shows pharmacologically

## Synthesis and antioxidant activity of some new substituted pyrazolo [4, 5-e]-4H-pyrimido[2,3-b] benzimidazoles

**Author(s):** Prashant N. Ubale, Sambhaji P. Vartale, Sandip G. Sontakke

**Email(s):** spvartale@gmail.com

**DOI:** 10.5958/0974-4150.2017.00095.5

**Address:** Prashant N. Ubale, Sambhaji P. Vartale\*, Sandip G. Sontakke  
PG Research Centre, Department of Chemistry, Yeshwant Mahavidyalaya Nanded-431602  
(MS), INDIA.

\*Corresponding Author

**Published In:** Volume - 10, Issue - 4, Year - 2017

**Keywords:** Pyrazole, pyrimido benzimidazole, fused heterocycles, antioxidant activity.

### Cite this article:

Prashant N. Ubale, Sambhaji P. Vartale, Sandip G. Sontakke. Synthesis and antioxidant activity of some new substituted pyrazolo [4, 5-e]-4H-pyrimido[2,3-b] benzimidazoles. *Asian J. Research Chem.* 2017; 10(4):573-576. doi: 10.5958/0974-4150.2017.00095.5

 View PDF

## Synthesis and antioxidant activity of some new substituted pyrazolo [4, 5-e]-4H-pyrimido[2,3-b] benzimidazoles

**Prashant N. Ubale, Sambhaji P. Vartale\*, Sandip G. Sontakke**

PG Research Centre, Department of Chemistry,  
Yeshwant Mahavidyalaya Nanded-431602  
(MS), INDIA

## Effective Removal and Recovery of Fast Green FCF Dye from Wastewater using Green Adsorbent

\*Shakuntala Sawant, Kiran Lalge, Sandip Labade,  
Nilesh Khengre and Arvind Burungale

*Post-Graduate Department of Chemistry and Research Centre,  
S.M. Joshi College, Hadapsar, Pune – 28, Maharashtra, India.*

*\* Corresponding author*

### Abstract

Natural wool after certain treatment converted into powdered form and have been used as adsorbent for the removal and recovery of a Fast Green FCF dye from wastewater. Batch studies have been carried by observing the effects of pH, temperature, a concentration of the dye, an amount of adsorbent, a particle size of adsorbent, contact time, etc. The adsorption over powdered wool has been found endothermic and feasible in nature. The kinetic studies suggest the process following pseudo-first-order kinetics with the rate constant  $0.1957 \text{ s}^{-1}$  and involvement of particle diffusion mechanism. The bulk removal of the dye has been carried out by treatment with adsorbent followed by filtration through the syringe filter. Saturation factor for adsorbent has been calculated. Attempts have also been made to recover the dye by using dilute NaOH which results in 98- 100 % dye recovery.

**Keywords:** Powdered wool, Fast Green FCF, Adsorption, Kinetics.

### I. INTRODUCTION

It is well known that Industries producing textile, paper, rubber, plastic, leather, cosmetics, pharmaceutical and foodstuff, uses different types of dyes [1]. The discharges of these industries dispose of a huge amount of dye contents, which runs into water bodies and cause severe snags such as increasing the chemical oxygen demand (COD) and reducing light penetration and visibility, in water bodies thereby pose adverse effects on the aquatic life [2]. The presence of these dyestuffs in water

# Comparison between optical properties of doped and undoped GeO<sub>x</sub> Nanowires

<sup>1</sup>A. S. Katkar, <sup>2</sup>Y. B. Kholam, <sup>3</sup>P. N. Shelke

<sup>1</sup>Department of Physics, Dr. B.N. Purandare Arts and Smt. S.G. Gupta Commerce College, Valvan, Lonavla 410 403, India.

<sup>2</sup>Department of Physics, B.R.Gholap College, Sangvi,Pune 411027, India

<sup>3</sup> Department of Physics, Anantrao Pawar College, Pirangut, Pune 412 115, India.

**Abstract:** Cr-doped germanium oxide nanowires, germanium oxide nanowires have been synthesized using physical vapor deposition method. For growth of nanowires and Cr-doped nanowires the experimental conditions were similar except doping source. The doped germanium oxide nanostructures such as Cr-doped germanium oxide nanowires will be effective in influencing the optical properties of germanium oxide nanostructures, since they may tune their band gap energy.

**Keywords:** Germanium oxide; Doping; Nanowires; Nanotubes; Optical properties.

## I. Introduction

One-dimensional (1D) nanostructures are very promising candidates because of their potential for elucidating promising applications in magnetic, optical, and electronic devices [1]. Owing to contribution to understand fundamental concepts in mesophysics and potential applications in nanoelectronic devices, recently special attention has been paid to 1D nanostructures such as nanotubes and nanowires. Germanium oxide (GeO<sub>x</sub>) is of particular interest, since it is a transparent conducting oxide (TCO) with high potential in optoelectronics communication devices such as optical waveguides for integrated optical systems [2]. The linear coefficient of thermal expansion and refractive index of GeO<sub>2</sub> glass is higher as compared to SiO<sub>2</sub> glass [3]. The GeO<sub>x</sub> is a blue luminescent material and plays vital role in vacuum technology. Hence fabrications of GeO<sub>x</sub> nanostructures are always useful for future optical nanodevices. The low-dimensional nanostructures of GeO<sub>x</sub>, such as nanowires, nanoneedles, nanowiskers or nanotubes [4,5] are potentially useful for various industrial applications. Using various physical and chemical methods such as physical vapor deposition, carbothermal reduction, laser ablation and thermal oxidation, different nanostructures: nanowires, nanoneedles, nanotubes and nanowiskers of GeO<sub>x</sub> have been prepared by germanium (Ge) and GeO<sub>2</sub> precursor powders [6-8]. The doping in GeO<sub>x</sub> nanostructures with rare earths elements, transition metal elements (Er and Eu) and metal impurities (Sn and Mn) shows that doping impurities can tune the optical properties of GeO<sub>x</sub> nanostructures [9-13]. The Ge nanowires, GeO<sub>x</sub> nanowires and nanotubes have been synthesized and their optical properties were investigated [14, 15]. The GeO<sub>x</sub> nanostructures have wide band gap energy and their optical properties promised interesting applications as in fabrication of optoelectronic devices. The doped GeO<sub>x</sub> nanostructures (nanowires and nanotubes) will be effective in influencing the optical properties of GeO<sub>x</sub> nanostructures since they may tune their band gap energy. As suitable impurities can affect physical properties of GeO<sub>x</sub> nanostructures, the waveguiding behavior of undoped and doped germanium oxide nanowires and nanotubes would be interesting and will be useful to fabricate future optical nanodevices.

In view of this, in present work, GeO<sub>x</sub> nanowire and Cr doped GeO<sub>x</sub> nanowires are synthesized by using a simple vapor transport nanotubes in the visible region is explored.

## II. Experimental

The commercial germanium (Ge), germanium oxide (GeO<sub>2</sub>), chromium oxide (Cr<sub>2</sub>O<sub>3</sub>), (all from Alfa Aesar and 99.99 % pure) powders were used as precursor materials. The p-type silicon (001) wafer was ultrasonically cleaned in ethanol for 15 min. The 3 nm thick gold film was deposited on wafer at room temperature (RT) by using an electron beam evaporation

# Synthesis of Ge/GeO<sub>x</sub> nanochain structure using simple vapor transport method

A. S. Katkar<sup>1,\*</sup>, Y. B. Kholam<sup>2</sup>, P. N. Shelke<sup>3</sup>

<sup>1</sup>Department of Physics, Dr. B.N. Purandare Arts and Smt. S.G. Gupta Commerce College, Valvan, Lonavla 410 403, Maharashtra, India.

<sup>2</sup>Department of Physics, Baburaoji Gholap College, Sangvi, Pune 411027, Maharashtra, India.

<sup>3</sup>Department of Physics, Anantrao Pawar College, Pirangut, Pune 412115, Maharashtra, India.

## Abstract

The Ge/GeO<sub>x</sub> core-shell nanochain kind of structure was grown on P-type silicon (001) wafer by using simple vapor transport method. The ultra small diameter Ge quantum dots (QDs) were found to be connected with insulator germanium oxide (GeO<sub>x</sub>). The nanochain kind of structure was stimulated to investigate possibilities to synthesize uniform nanochain structure, so that it will be used to fabricate Ge nanochain single electron transistor (SET) device, which holds one electron in each Ge QD. With these useful findings at room temperature, Ge/GeO<sub>x</sub> nanochain SET devices may allow to envisage in modern digital and analog circuits.

**Keywords:** Ge; GeO<sub>x</sub>; Nanochain; Vapor transport method; Quantum dots.

## 1. Introduction

In recent few years, the size of conventional transistors has shrunk incredibly to nanometer scale, which makes modern electronics rapid, efficient and portable [1]. During 1980's the single electron tunneling (SET) and Coulomb blockade phenomena were major discoveries in modern physics [2, 3]. As the SETs have advantages like ultra-low power consumption and high density integration, the SET device has been investigated extensively from last two decades [4]. Usually a simple SET device consist of a nanometer scale islands isolated by tunnel barriers with sufficiently large resistance ( $R > h/e^2$ ). Until now varieties of SET devices working at room temperature (RT) has been demonstrated with different materials [5 - 10]. But its physical implementation is very difficult such as; to design and fabricate SET device with optimum junction capacitances and resistances with which thermal scattering effect on the tunnel junctions cannot be avoidable.

To develop the practical SET device, it is significant to control the size of islands and tunnel junctions so that only single electron can confined within a small volume and localized on one side of the junction and can tunnel when an external applied voltage will be greater than  $e/C$ . The single-electron charging energy calculated within Si nanochain arise the hope that system like superlattice structure of quantum dots (Si core) with connecting insulating potential barriers (SiO<sub>2</sub>) can used as a magnetic tunnel junction (MTJ) SET [11].

# NUMERICAL SIMULATION OF BLOOD FLOW WITH SODIUM ALGINATE (SA) NANO PARTICLES IN STENOSED HUMAN ARTERIES IN THE PRESENCE OF BODY ACCELERATION

**Neeta Kankane**

Maharashtra Institute of Technology, Pune, Maharashtra-411038, India

**Nitin S. Bodke**

Dr. B. N. Purandare Arts, S. S. G. G Commerce and Science College, Lonavla, Maharashtra-410403, India

**Ignatius Fernandes**

Rosary College, Navelim, Goa, India

## ABSTRACT

*Numerical simulation of blood flow with sodium alginate nano particles in stenosed human arteries in the presence of body acceleration is obtained. Effect of sodium alginate (SA) nano particles in the presence of body acceleration is observed on velocity, flow rate and resistive impedance to blood flow in stenosed human artery. The governing equations are discretized by explicit finite difference scheme. The discretized equations are simulated using MATLAB. Velocity, flow rate and impedance to flow are observed to be influenced in the presence of both nano particles as well as body acceleration. The joint effect of nano particles and body acceleration is also observed. Resistance to flow is observed to be less in the presence of nano particles. This nano particle drug delivery may be useful for patients having cardiovascular diseases.*

**Key words:** Nano fluid, stenosed artery, body acceleration, sodium alginate nano particles

**Cite this Article:** Neeta Kankane, Nitin S. Bodke, Ignatius Fernandes, Numerical Simulation of Blood Flow with Sodium Alginate (SA) Nano Particles in Stenosed Human Arteries in the Presence of Body Acceleration. *International Journal of Mechanical Engineering and Technology* 10(6), 2019, pp. 211-219.  
<http://www.iaeme.com/IJMET/issues.asp?JType=IJMET&VType=10&IType=6>

---

## 1. INTRODUCTION

Nano particle drug delivery is rapidly developing tool for treating various diseases. Nanomedicine is the science where materials in the nanoscale range are delivered to targeted part in controlled manner. Nowadays, nanotechnology is useful for enhancing efficacy of



# Advanced Room Temperature Single-Electron Transistor of a Germanium Nanochain with Two and Multitunnel Junctions

Amar S. Katkar, Shobhnath P. Gupta, Carmine Granata, Ciro Nappi, Wilfrid Prellier, Lih-Juann Chen, and Pravin S. Walke\*



Cite This: *ACS Appl. Electron. Mater.* 2020, 2, 1843–1848



Read Online

ACCESS |



Metrics & More



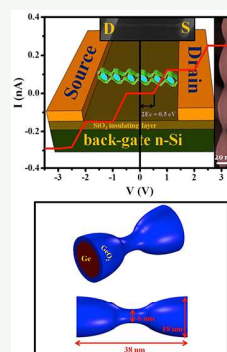
Article Recommendations



Supporting Information

**ABSTRACT:** The single-electron transistor (SET) has tremendous importance in the microelectronic industry on account of low-power consumption, an ultrasmall size, and a large integration prospect. The key challenge is to resolve the fabrication issues of a SET to realize a mechanically steady device with reproducible and controllable transport characteristics that operate at room temperature. Herein, we report on the realization of robust and well-controlled SET devices with at least two junctions and multijunctions using an advanced nanochain (NC) architecture of germanium nanoparticles rooted by a germanium oxide ropeway. These two-junction and multitunneling-junction (MTJ) SET devices exhibit an ideal Coulomb staircase behavior of single-electron charge transfer at room temperature and obeyed the theoretical path of increasing threshold voltage with the number of tunnel junctions. This Coulomb transistor prospects magnificent rewards of room-temperature operation, periodic Coulomb oscillations, well-controlled threshold voltage and large on/off ratios and have the potential to modernize the random access memory and digital data storage technologies.

**KEYWORDS:** single-electron transistor, nanochain, Coulomb blockade, Coulomb oscillations, single and multitunnel tunneling junction



## INTRODUCTION

Single-electron transistor (SET) devices have incredible significance in the next generation microelectronic industry owing to low-power utilization, a smaller size, and high integration possibility and consist of nanometer scale islands isolated by tunnel barriers with nanoscale precision maintaining sufficiently large resistance ( $R > h/e^2$ ).<sup>1–7</sup> The current at the level of one electron can be controlled by the voltage ( $>e/C$ ) on a capacitive gate through the Coulomb blockade effect. The resulting transfer characteristics exhibiting periodic on and off states, i.e., Coulomb oscillations possibly offer new futuristic applications.<sup>7,12–15</sup> These devices are hindered by their low working temperature; nevertheless, the ranges of SET devices working at room temperature (RT) are demonstrated using the variety of materials.<sup>7,10,16–19</sup> However, its physical implementation is restricted due to the fabrication limitations concerning optimum capacitance and resistance of the junction to avoid a thermal scattering effect in the tunnel junctions at RT. Moreover, the SET device working at RT rarely follows a uniform periodic fluctuation of current ( $I_{ds}$ ) with variable gate voltages ( $V_g$ ), which indicates plausible single-electron tunneling through the device.<sup>18,19</sup> Subsequently, the substantial control on the geometrical aspect is very crucial; the size of the island must be small enough to confine a single electron within a small volume at one side of the junction to obtain Coulomb blockade phenomena. Therefore, realizing reproducible, robust nanoscale devices with small capacitances (0.03–0.07 aF) of

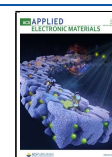
the tunnel junctions ( $<10–20$  nm) is a major concern for the development in nanoelectronics.<sup>15–20</sup>

To overcome the fabrication difficulties, a variety of processes are developed by a lift-off process to achieve a SET device onto a planar surface;<sup>13</sup> however, it is limited by the resolution of lithography to the resulting capacitances. For example, it is difficult to apply a quasiatomic contact to a nanosize gap between the two electrodes with allowed electromigration.<sup>9</sup> Alternatively, the bottom-up using fabricated carbon nanotubes or semiconducting nanowires (NWs) are used to define the island.<sup>16</sup> These zero- and one-dimensional nanostructures emerged as convincing schemes to overcome the restrictions of planar constructions.<sup>17–19</sup> Remarkable efforts have been devoted fabricating quasi-1D nanostructures succeeding with the appropriate morphology, composition, geometry, or crystal structures.<sup>17</sup> Recently, band structure engineering through precise epitaxial growth of core–shell NWs triggered the examination of one-dimensional hole–gas systems,<sup>20</sup> striking for both fundamental aspects and modern nanoelectronics.<sup>21</sup> Although the extensive innovative experimental reports on GeSi<sup>22</sup> and Ge–Si core–shell

Received: March 26, 2020

Accepted: June 12, 2020

Published: June 12, 2020



## Leaf Clearing: A Review

Saima Rashid Mir<sup>1\*</sup>, V.A Patil<sup>2</sup>, B.M Shinde<sup>1</sup> and M.M Jana<sup>2</sup>

Department of Botany Prof-Ramkrishna More A.C.S College Akurdi Pune

Corresponding author e-mail : saimarashidmi@gmail.com

**The clearing of leaves to reveal the leaf venation can be successfully accomplished by diverse methods. Leaf venations are an important feature for botanists and taxonomists to identify and catalogue a plant species, it has several waves of interest among morphologists and paleobotanists in studying of plant material total as such. Cleared leaves of different plant species can be stained and mounted to form ineradicable and permanent specimens applicable for research and class room study. The present paper depicts the review of literature on leaf clearing and its significance in Plant Sciences.**

**Keywords: Leaf clearing, Leaf venations, Plant Sciences.**

### INTRODUCTION

A review of literature plays an important role in depicting quantum of work done in related area of study. A brief review of literature on leaf clearing may be helpful in grasping the existing scenario, more over in understanding the significance of subject, untouched areas and hence the scope of work to be carried out.

Leaf veins are hierarchical fine lines of variant sizes and designs found on the surface of the leaf (Saba, *et al.*, 2012). This venation network is chiefly composed of lignified xylem and phloem which has various functions including transport of water and sugars, mechanical support etc (Roth-Nibelsick, *et al.*, 2001) Leaf framework including size, shape margin, leaf base, tip, veins and petiole plays important role in classification, systematic and ecology (Ellis, *et al.*, 2009) The venation patterns are important features for classification and evolution of angiosperms than the other leaf characters, because their orientation and quantitative characters are relatively stable at the species level (Fang, *et al.*, 2002; Haung, *et al.*, 2004). The plants can be identified on the basis of its external structures such as leaf, seed, fruits and flowers in accordance to the plant taxonomy theory (Goeau, *et al.*, 2013). However, in various studies leaf characteristic were found more significant in species identification (Hoshang, *et al.*, 2018). The study of leaf architecture was initially explored by paleobotanists in 1950s (Foster, A. 1936).The leaf

venations are applicable to extensive areas of research, these include the evolution of leaf form and function (Boyce and Knoll, 2002) genetic and other mechanism in the ontogeny of leaf venations (Candella, *et al.*, 1999) applications in systematic and evolutionary biology, veins are useful in taxonomy (Ellis, *et al.*, 2009) and for studying climatic change and macro evolutionary trends (Boyce, *et al.*, 2009; Brodribb and Field, 2010; Field, *et al.*, 2011). For developmental biologists veins are the prominent features in understanding vascular patterning and tissue differentiation (Candela, *et al.*, 1999; Scarpella, *et al.* 2010; Sack, *et al.* 2012). Leaf vein impressions are the most abundant plant macro fossils available to paleobotanists, thus the ability to more rigorously quantify vein geometry has the potential to aid attempts to identify fossil samples with greater phylogenetic resolution (Behrenmeyer, *et al.*, 1992). Levin(1929) explained that leaf venation patterns have high taxonomic value and suggested that a species has a constant number of veins that can be used for species identification Dilcher(1974) stated that a study on the nature and structure of leaf venation has significant implications for the relationship between taxonomy and phylogeny.

With suitable method of clearing the venation network of diverse leaves can be exposed and can be largely used for all the applications mentioned above. In botanical and taxonomical research the technique of

## **“Facile and Efficient One Pot Synthesis of Substituted Benzimidazoles under Ultrasonic Irradiation Using Novel Active 3% Cu-Doped Zinc Oxide Catalyst and Their Antimicrobial Activity ”**

**Malhari C. Nagtilak\***

**Dr. B. N. Purandare Arts, Smt. S. G. Gupta Commerce and Smt. S .A. Mitaiwala Science College, Lonavala-410403**

**\*Email- [malhari.nagtilak22@gmail.com](mailto:malhari.nagtilak22@gmail.com)**

### **Abstract :**

Herein, we report for the first time, the synthesis of substituted benzimidazoles through the coupling of Aromatic aldehydes with o-phenylenediamine by using recyclable, highly efficient and new 3% Cu-doped Zinc oxide catalyst in Ethanol under ultrasound irradiation and afforded high yields (92-99 %) in a short period of time(10-20 min). Spectral data and Physical constant confirmed the formation of favored product. Antimicrobial activity of synthesized benzimidazoles compounds were checked and found extensively active against various gram positive , gram negative bacteria, yeast and some fungus. Simple methodology, short reaction times ,environmentally benign, mild reaction conditions with easy work-up procedure, inorganic low cost recyclable catalyst are the prominent features of this method. Great achievement of this work is to used catalyst atleast five to six times without losing its catalytic activity.

### **Key words :**

Ultrasonic Irradiation , Active 3% Cu-doped Zinc oxide Catalyst, Benzimidazole, o-phenylene diamine, Aromatic aldehyde, Ethanol , Antimicrobial activity.