ATUL VIDYA MANDIR WARDHA'S

RAJARSHEE SHAHU SCIENCE COLLEGE

Chandur Railway, Dist – Amravati, Maharashtra

Affiliated to

Sant Gadge Baba Amravati University, Amravati

2nd Cycle

Assessment & Accreditation by NAAC

CRITERIA III- Research, Innovation and Extension

3.3.1: Research Publication and Awards

Metric No. – 3.3.1.1

Number of research papers published per teacher in the Journals notified on UGC care list during the last five years

Atul Vidya Mandir, Wardha's

Rajarshee Shahu Science College

Virul Road, Chandur Rly, Dist. Amravati PIN - 444 904

(College Code : 807)

PRESIDENT
Prof. Mrs. Uttaratai V. Jagtap

SECRETARY
Prof. Virendrabhau W. Jagtap

PRINCIPAL
Dr. M.P. Chikhale

Website : www.rssc.edu.in | Email : rajarsheeshahucollege@rediffmail.com | rsscprincipal@gmail.com | ☎ (Office) 07222-254111

Ref. No. RSSC/132/23

Date: 17.03.2023

Declaration

The information, reports, true copies of the documents, numerical data, etc furnished in this file is verified by IQAC and found correct.

IQAC Co-ordinator
Rajarshee Shahu Science College
Chandur Rly., Dist. Amravati

(Dr. Minal Keche)

Rajarshee Shahu Sc. College SEAL 807 Chandur Rly

Principal
Rajarshee Shahu Science College
Chandur Rly. Distt. Amravati

(Dr. Mahesh Chikhale
Chairman IQAC and Principal)

Research Publication and Awards 3.3.1.1

7.Ultrasonic Measurements of (2e)-1-(4-Thiocarbamidophenyl) -3-(3,4-Dimethoxyphenyl) Prop-2-En-1-one At 600c in 70% Dioxane-Water Mixtures	**20**
At constant concentration viscometric measurement of 1-phenyl 3-{4 (3 ethylimino-1,2,4-dithiazolo) aminophenyl}prop-2-ene-1 one in 70% ethanol water mixture using various temperature	**21**
Synthesis of Nano-Cadmium Sulphide Using Urea as a Capping Agent	22
To Study AC electrical conductivity of TiO2 doped polyaniline	**23**
"Synthesis, Spectral characterization, thermal and biological studies of Cu(II), Co(II), Th(IV) and Zr(IV) complexes with symmetric thiocarbohydrazone ligand"	**24**
Synthesis, structural Analysis and phytophysical parameters of isoxazoline derivatives	**25**
Using Fourier Transform Technique Investigate of Temporal and Spatial Coherence of Radiative Material.	
Electron Temperature as Well as Radial Profile of Spectral Emission Also Change Due to Formation of a Laser Pulse.	
Some Properties of Local Fractional Mellin-Fractional DoubleLaplace Transform	**26**
Inversion Formula For Local Fractional Mellin- Fractional Double Transform	**27**
Morphological Variability in Gamma Radiated Wild Pea	**28**
Protein Estimation by Bradford's Method in Gamma Radiation (wild) Pea.	**29**
Protein Profile Pattern in Gamma Irradiated Wild Pea	**30**
Mononuclear pyrazine-2-carbohydrazone metal complexes: Synthesis, structural assessment, thermal, biological, and electrical conductivity studies	**31**
Synthesis, Characterization, Biological Activity and Solid State Electrical Conductivity Study of Some Metal Complexes Involving Pyrazine-2-Carbohydrazone of 2-Hydroxyacetophenone,	**32**
Studies in Solute-Solute and Solute-Solvent Interaction of Some Substituted Ketimine Drugs in 75 % Dichloromethane Water Mixture under Different Temperature by Viscometric Technique (PP- 89-93)	**33**

3.3.1.1. Number of research papers in the Journals notified on UGC CARE year wise during the last five years

Year	2017-18	2018-19	2019-20	2020-21	2021-22
Number	08	13	04	04	06

Dr .M.P Chikhale (Zoology)

Journal of Research and Development

Vol - 08, Special Issue - 08, Feb. 2018, ISSN-2230-9578

Orb Web Construction in Eriovixia Excelsa Simon, 1889 (Araneae : Araneidae)

M. P. Chikhale
Rajarshree Shahu Science College,
Chandur Rly,
Dist.Amravati - 444904

G.B.Santape
Rajarshree Shahu Science College,
Chandur Rly,
Dist.Amravati - 444904

A. K. Bodkhe
J.D.PatilSangludkar Mahavidyalaya,
Daryapur,
Dist.Amravati - 444803

Abstract

The spider's web is an animal creation with a known function that allows in depth studies of its ecology, biomechanics, behaviour and evolution.The study was focus on orb web biology of a poorly known araneoid spider Eriovixiaexcelsa Simon, 1889 (Araneae:Araneidae). We calculated Capture area, Web asymmetry, Hub asymmetry, Mesh width, Web width and Web height as well as radial and spiral counts.We observed that web is disturbed when they run away from hub or jump off the web also recordedprey from webs in order to Diptera>Homoptera> Hymenoptera >Coleoptera.Thereforewe concluded that Eriovixiaexcelsa maintain the basic web architecture during prey capture and it reflects many selection pressure in the environment.

Keywords: *Eriovixiaexcelsa*,Orb Web, Web Pattern, Prey capture .

Introduction

Spiders also serve as good biological indicators for evaluating the impact of anthropogenic disturbance on natural ecosystems (Maelfait and Hendrickx, 1998). Their webs are useful indicators of environmental chemistry (Hose et al., 2002) and their growth has been used as an indicator of habitat quality (Vollrath, 1988). Orb-weaving spiders are easier to be located and collected than other Araneae taxa, because orb web construction not only makes the spiders more conspicuous, but also restricts their movement (Robinson & Robinson 1974). Chikhale and Santape, 2015 study the behavioural strategy of orb weaving spider *zygiellaindicatikader* & bal, 1980 from the coffee growing area of Chikhaldara in the state of Maharashtra, India.

In India, when compared *Eriovixiaexcelsa* with other orb weavers spiders behaviour is better understood than *Eriovixiaexcelsa*. *Eriovixiaexcelsa*(Simon,1889) is a common orb-web spider in the citrus plantation of Morshi region in the state of Maharashtra, India. The present study was carried out to understand the ecological role of this species in the citrus plantation area, which will be helpful the web construction behaviour of this species.

MATERIALS AND METHODS

Study area: The present work was carried out in agricultural fields from MorshiTahsil (21.3392°N&78.0131°E). Morshi is a Tahsil place in Amravati district and claims the distinction of being the orange growing area in the state of Maharashtra, India.The present study was carried out during 2015 and 2016 in the from citrus fields.During the study the daily temperature ranged from 28 ± 4°C (at night) to 35 ±4°C (during the day).

Characteristics of the web : We measured web characteristics of *Eriovixiaexcelsa* (Simon,1889)directly in the field (n = 63 ; 34 in 2015 and 29 in 2016). For this purpose study was conducted in the evening. Only the webs of adult specimens were used for the study. Before recording the web data, each web was sprayed with corn-starch using sprayer to improve the resolution for measurement and measured them with a tape measure.

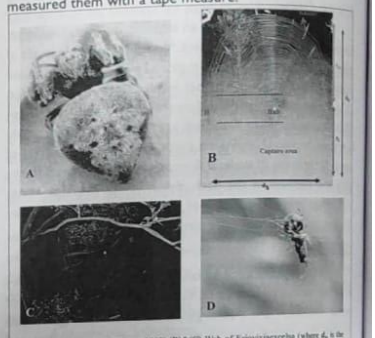


Fig 1(A) Eriovixiaexcelsa (Simon,1889),(B)&(C) Web of Eriovixiaexcelsa (where d_v is the vertical , d_h is the horizontal diameter , H is the average diameter of the hub and five zone. r_u is the length of the upper radius along the vertical axis and r_l is the length of the lower radius), (D) Food captured by *Eriovixiaexcelsa*

Field parameters: We identified following web characters from araneoid web literature (Blackledge, and Gillespie, 2002),(Kuntner et al.,2008 a), (Kuntner et al.,2008 b), (Gregoric, et al. ,2010).Primary radii, number of vertical sticky spirals, number of horizontal sticky spirals, non-circulating sticky spirals below hub, non-circulating sticky spirals above hub, web width (in cm), web height (in cm) from the collected spiders were measured. Measurement of body length in mm (n = 12) and web characteristics recorded in the field. Time requirement for completion the web was noted (n = 10).The height from the ground level of web is measured from ground level to first vertical number of non-circulating sticky spirals below hub. The preys collected from the webs of spiders were identified up to order level.

Calculated Parameters: We calculated the following parameters:-

Dr. S. S. Thakare (Chemistry)

Thakare and Dhote, IJPSR, 2020; Vol. 11(1): 407-412. E-ISSN: 0975-8232; P-ISSN: 2320-5148

IJPSR (2020), Volume 11, Issue 1 **(Research Article)**

INTERNATIONAL JOURNAL OF PHARMACEUTICAL SCIENCES AND RESEARCH

Received on 27 March 2019; received in revised form, 05 July 2019; accepted, 17 July 2019; published 01 January 2020

DESIGN AND CHARACTERIZATION OF SOME NEW NON-SYMMETRIC SUBSTITUTED TRIAZINES AND TRIAZINE DERIVATIVES

S. S. Thakare * and S. N. Dhote

Rajarshee Shahu Science College, Chandur Rly, Amravati - 444904, Maharashtra, India.

Keywords:

2,4,6-trichloro-1,3,5-triazine, 1-Naphthol, 4-Phenyl phenol, 2-Mercapto benzothiazole, Thiophenol, Antimicrobial activity

Correspondence to Author:
S. S. Thakare

Rajarshee Shahu Science College, Chandur Rly, Amravati - 444904, Maharashtra, India.

E-mail: sarojdhote3@gmail.com

ABSTRACT: Attempts were made to carry out the laboratory synthesis of non-symmetric mono-, di- and tri- substituted 1, 3, 5-triazines by the action of the electron-donating substituent on 2, 4, 6-trichloro-1, 3, 5-triazines by aromatic nucleophilic substitution reaction mechanism ($S_{N}Ar$ reaction) by temperature controlled. The introduction of the amino group (-NH-), ether (-O-) and thiol (-S-) Linker Bridge show more promising antibacterial activity. The yield of newly synthesized compounds was quite well, and their structures were confirmed by using IR, ^{1}H NMR, and Mass spectral data.

INTRODUCTION: The chemical compound 1,3,5-triazine, also called s-triazine, it is an organic chemical compound whose chemical structure has a six-membered heterocyclic aromatic ring consisting of three carbon atoms and three nitrogen atoms. It is soluble in most organic solvents and very soluble in water. By using 2, 4, 6-trichloro-1, 3, 5-triazine (Cyanuric chloride), three chlorides can be replaced by amine, alcohol, Sulphur and Grignard reagents [1]. All of the s-triazine derivatives that have wide practical applications. 1, 3, 5-Triazine is having - mono, di- or tri-substituted, symmetrical and non-symmetrical compounds bearing different substituents. In 2, 4, 6-Trichloro-1, 3, 5-triazine the ease of displacement of chlorine atoms by various nucleophiles, in the presence of a hydrochloride acceptor (usually sodium carbonate, bicarbonate), makes this reagent useful for the preparation of mono-, di- and tri-substituted 1, 3, 5-triazines.

QUICK RESPONSE CODE

DOI: 10.13040/IJPSR.0975-8232.11(1).407-12

The article can be accessed online on www.ijpsr.com

DOI link: http://dx.doi.org/10.13040/IJPSR.0975-8232.11(1).407-12

The substitution pattern depends on the structure of the nucleophile, its basic strength, and steric factors, the substituent already present in the s-triazine ring and the nature of the solvent used [2]. By controlling the temperature, time and optimization of variables, such as solvent and base, the substitution of chlorine in cyanuric chloride with different substituents can be accomplished in one pot, if the correct order of addition of nucleophiles is followed (e.g., O-nucleophiles followed by N-nucleophiles). This was then reacted with separately prepared mono-substituted dichloro-s-triazine [3]. The tri-substituted derivatives were obtained by nucleophilic reaction with an amine or by a Suzuki coupling reaction with phenylboronic acid. s-Triazine derivatives have received considerable attention due to their potent biological activity such as anticancer [4, 5], estrogen receptor modulators, antimitotic, antivirals, and antimalarial. It has been reported that triazine derivatives possess potent antimicrobial activity [6, 7, 8].

In the context of identification of new chemical entities for cancer therapy, s-triazine as core scaffold as many reports indicate its significance and structural modifications were made at three

Mr. M. P. Waghmare (Librarian)

ISSN: 2394 5303 | Impact Factor 5.011(2017) | Printing Area International Research Journal | April 2018 Issue-49, Vol-01 | 033

08

National Digital Library of India
: A Boon for Users

Mr. Manoj P. Waghmare
Librarian, Rajarshee Shahu Science College, Chandur Rly.

Mr. Shubham Polade
Librarian, Gandhigram college, Wardha

Abstract

The concept of library is continuously evolving. These days, with the use of ICT tools the quality and quantity of contents available online are improving. The NDL aims to streamline Institutional Digital Repository (IDR) and other study material into one common online. This topic we are giving the information about National Digital Library of India and its resources, present status, registration process, features sources, objective, survey of the users, boon for the all users.

Keywords: NDL, MHRD India, NMEICT, IDR, ICT, IIT Kharagpur, IIT Madras, E-resources. NDL India mobile app.

Introduction

The concept of library is continuously changing. Formally few years ago the library is situated in building. These days, with the use of ICT the quality and quantity of resources available in library are improving. Libraries are grows rapidly and the idea, library is just a building is changing. With the use of ICT the resources of libraries are get online and user can access that in all over the world. In India, the digital library initiatives have been sponsored by various ministries and organization. National Digital Library is the one of that which causes grate impact on the e-resources. In spite of several such initiatives, most of the challenges faced by students, teachers and general users in using digital contents remain unaddressed to a large extent. In this paper we discussed how National Digital Library boon for the user information. The NDL aims to form Institutional Digital Repository and gather study material into one common place. Mobile app (NDL India) is also available in NDL for users.

Objectives of study

- To study the meaning of e-resources and digital library
- To understand and explain the use of NDL
- To study the factor which impact on the use of NDL.
- To study the responsibility of user.
- NDL is really national asset of India.

What is National Digital Library?

The Ministry of Human Resource Development under National Mission on Education through Information and Communication Technology (NMEICT) initiated the National Digital Library (NDL) Pilot Project in April, 2015 with project cost of Rs. 39.8 Corers. The National Digital Library Project is coordinated by the Indian Institute of Technology, Kharagpur. NDL covers setting up 24X7 infrastructures, providing single window search and browse facility for e-Learning resources to users, including e Contents that are available in various institutions of the country by integrating Institutional Digital Repository (IDR) of respective institutions and registering users from Participating Institutions. The alpha version of the NDL Portal has been made operational on February, 2016, which is available at https://ndl.iitkgp.ac.in. Since it is a Digital Library, it is seamlessly available without any State/UT wise physical or accessibility constraint. National Digital Library is accessible to all students, teachers, researchers, Government Officials, Public Servants, etc. irrespective of their State/UT. National Digital Library currently hosts contents in 70 languages, both in Indian and Foreign. The user interface through which users

Dr. A. P. Pachkawade (Physics)

Aayushi International Interdisciplinary Research Journal (AIIRJ)
ISSN 2349-638x Impact Factor 4.574 Special Issue No. 25
UGC Approved Sr.No.64259 Website :- www.aiirjournal.com Email id:- aiirjpramod@gmail.com

LASER TRANSITION AS A FUNCTION OF TIME FOR DIFFERENT INITIAL INVERSION DENSITIES

[1]V.K. Jadhao & [2]A.P. Pachkawade
[1]B.B.Arts,N.B.Commerence and B.P. Science College,Digras.Dist. Yavatmal(M.S.)
[2]Rajarshee Shahu Science College, Chandur Rly.Dist. Amravati(M.S.)
ashwinashwin1978@rediffmail.com

ABSTRACT

We have computed normalized inversion density of the laser transition as a function of time for different initial inversion densities of the transition. The time is taken as initial time when the discharge pulse is fired. The behavior of inversion density has been studied for initial inversion density from 0.1 through 1.If the pumping pulse is longer enough. However, as the pumping pulse width increases the electrical efficiency of laser system decreases because the lower laser state gets more and more populated reducing the population density. In case of 3371 A ultra violet pulsed nitrogen laser the inversion time is measured by Steinvall and Anvary.

Keywords: *glow discharge, interface, radiation intensity, emission*

INTRODUCTION

In order to increase the laser pulse peak power and pulse width, the knowledge about the inversion time is very much essential. In case of CVL the pumping pulse produces the inversion favorable for the stimulated emission. In the CVL discharge the upper state must be excited with the high excitation rate by the electron impact excitation within a very short interval of time. A high voltage and high current discharge pulse having narrow' pulse width passed through the copper-helium or copper-neon mixture produces high inversion density [24]. After the production of the inversion the stimulated emission and spontaneous emission together destroy the population inversion produced by the pumping pulse. After a typical time interval the inversion becomes zero and then after some time it becomes negative. The laser medium favors amplification as long as the population inversion is present. When the inversion becomes negative it starts absorbing the radiation consequently reducing the laser beam intensity and energy. The time interval within which the population inversion produced by the exciting pulse becomes zero may be called as inversion time.

The inversion time is determined together by the shape of the pumping pulse, the temperature of the electrons in the pumping pulse, the fluorescence life time of the laser state, density of lower laser state and the flux of the stimulating radiation.

POPULATION AND DEPOPULATION OF THE LASER STATES

It has been extensively discussed that the laser states are dominantly populated by the electron collisions. The excitation rate would depend upon the electron density, copper density and electron impact excitation rate. The laser states are also excited by the cascading processes. The energy states of copper atoms lying above the laser levels are excited with low excitation rate coefficient. Moreover, the higher states are coupled to the other states also reducing the excitation rate of the laser states. Thus, the contribution of the cascading processes to the excitation of the laser states is negligible. The computation of the inversion density, the electron collision de-excitation of the laser states may be considered as negligible. Thus, in absence of the stimulated emission of the radiation the rate governing the density of the upper laser state is expressed as

$$\frac{dN_u}{dt} = \frac{-N_u}{\tau_u} \qquad (1)$$

having the solution

$$N_u(t) = N_u(0)\exp(-t/\tau_u) \qquad (2)$$

where, N_u (0) is the population of the upper laser state at time t = 0 (i.e. when the discharge pulse is fired), τ_u is the fluorescence life time of the upper laser state. The energy states of the copper atom are radiatively coupled to the state having radiative decay life time 40 nsec. In fact, the state decays only to populate the lower laser state. Thus, the

Dr. A. P. Pachkawade (Physics)

Aayushi International Interdisciplinary Research Journal (AIIRJ)
ISSN 2349-638x Impact Factor 4.574 Special Issue No. 25
UGC Approved Sr.No.64259 Website :- www.aiirjournal.com Email id:- aiirjpramod@gmail.com

INVESTIGATION UNDER DC GLOW DISCHARGE SPECTROMETRY

[1]K. P. Kadam, [2]A.P.Pachkawade, [3]G.R.Yerawar & [4]N.M. Khobragade
[1,3,4] Arts, Commerce & Science College, Arvi. Dist. Wardha (M.S.)
[2] Rajarshee Shahu Science College, Chandur Rly. Dist. Amravati (M.S.)
drkishorkadam1@rediffmail.com

ABSTRACT

Phenomenon of discharge of electricity through the study of property of ionized gases has proved to be fruitful for the investigation. The dc glow discharge spectrometry is the most essential part of the electrical and spectral emission studies of the molecules, atoms and ions in the interface of solid and liquid. We measured the intensity of radiation emitted by dc glow discharge as a function of discharge current for the different electrolytes along with V-I characteristics. The voltage-ampere characteristics during a glow discharge in the atmospheric pressure gas using an electrolytic solution as the anode and metal electrode like tungsten as a cathode were carried out. Under the study of glow discharges of various elements, a monochromatic light at various wavelengths generated. Few species shows a change in the color of the glow when discharge current increased. We investigated negative resistance of solutions. This behavior investigated as tunneling behavior of electrolytic solution using DC glow discharge.

Keywords: *glow discharge, interface, radiation intensity, tunneling.*

INTRODUCTION

Electrical and spectral characterization of the glow discharge [1-7] of the material helps in studying the chemical composition of the material. The elements in the material may be excited in the plasma [8] produced between liquid and solid interface. The neutral atoms, ionized atoms and molecules are excited and they emit characteristic spectrum and hence atomic, ionic or molecular species may be identified. Spectral study of the glow discharge [3,4,7,9] of the material helps in studying the chemical composition of the material. The solid liquid junction is formed when current is passed through the junction; a plasma film is generated along the interfaces between solid and liquid. The plasma pressure is very near to the atmospheric pressure [10,11,12]. [The plasma parameters in DC glow discharge may be generated by a current source [13].] The method is very low cost and quick results may be obtained and therefore has wide applications.

When electric discharge is passed to a conducting solution from an electrode, which is placed in the gas space above the liquid surface, reactions take place in the liquid phase and the process is referred to as "Glow Discharge Electrolysis (GDE)". The dc glow discharge continues to be the subject of spectroscopic research [15] and analytical method development. Glow discharges [14] are used for a variety of technological, physical and analytical applications, ranging from plasma etching and deposition systems in the micro-electronics industry, to lasers or even plasma monitors. Traditionally [14] dc-glow discharge optical emission spectroscopy is mainly applied in the materials sciences where it is used for bulk and surface analysis, pellets containing the adsorbed liquid and direct analysis of the liquid samples by use of adequate sample introduction techniques. Liquids can be analyzed directly at atmospheric pressures, when applying the atmospheric electrolyte cathode glow discharge cell approach with detection by emission spectroscopy as described by Cserfalvi and Mezei [3].

MATERIAL AND METHODS

The experimental arrangement used for the investigation of dc glow discharge is simple and. It is inexpensive arrangement and it is very much cost effective. It consists of tungsten electrode of length 40 mm and diameter 3mm fused in glass capillary tube and suspended axially in a hollow slotted stainless steel cylinder, of length 6 cm and internal diameter 2.54 cm. The stainless steel cylinder served as another electrode i.e. anode in the glow discharge. The suspended end of tungsten rod was carefully rounded. The tungsten electrode can be used as cathode by connecting it to the dc power supply of 700 V capacity having 1.5 A current capacity. In this arrangement the hallow cylinder was dipped in a electrolytic aqueous solution taken in a glass beaker. The depth of immersion of the tungsten electrode in electrolyte solution could be adjusted with the help of micrometer adjustable stand. By using this

Dr. A. P. Pachkawade (Physics)

National Conference on Recent Trends in Synthesis and Characterization of Futuristic Material in Science for the Development of Society
(NCRDAMDS-2018)
In association with
International Journal of Scientific Research in Science and Technology

Investigation of Ionization Recombination and Fractional Abudances of Different Ionic Spieces

A. P. Pachkawade
Rajarshee Shahu Science College, Chandur Rly, Amravati, Maharashtra, India

ABSTRACT

We obtained the ionization and recombination rate coefficients of the ions of Zn, Mg, Cd, Na, K, Se, Cu, Zr, Li, Ba, and Ni. From the knowledge of the ionization and recombination rate coefficients the fractional abundance's of different ionic species of the elements have been obtained. Displays of fractional abundances show that singly ionized elements (alkali metals and alkaline earth metals) may play very important role in the discharges. The singly ionized species show its appearance over very wide range of electron temperature. Further doubly ionized Magnesium also shows its appearance over very wide range of electron temperature.

Keywords: Laser radiation, inversion density, ionization and recombination, dimensions of the laser plasma.

I. INTRODUCTION

M.H.Elghazaly etal. (2007) have studied [1], the most important rate coefficients for electron collisions in noble gases, electron-neutral ionization and electron impact excitation [1]. S W Simpson et al. (1990) have studied ionization and recombination rates in argon plasmas [2]. They presented approximate model for treating multi-step ionization and recombination in inert gas plasmas [2].

The glow discharge consists of the electrons and the ions with different charges. The collisions between the atoms, ions of different charges and electrons result in ionization. At the same time the ions may capture the electrons and result in formation of ions of lower charge. The ionization and recombination processes compete each other so that the ionization rate and recombination rates reach; each to a certain value and the equilibrium is attained. As long as the electron temperature is not changed the equilibrium remains in a particular state. A change in electron temperature results in changing the densities of ions and electrons. Thus the densities of ions and electrons are completely dictated by the electron temperature. The discharge emission depends upon the fraction of the total density of a species remaining in a particular ionized state, the electron density and the electron temperature.

Fractional"The amount of the fraction of the total density of a species remaining in a particular ionized state is called as fractional abundance of that ion".

.

The concepts of fractional abundances have been widely used in order to explain the experimental results in Tokmak plasma discharge. Mathematically it may be expressed as [3,4,8]

$$F_{Z'} = \frac{N_{Z'}}{\sum_{Z} N_Z} \qquad (1)$$

where $F_{z'}$ is the fractional abundances of the ion with charge z'

1) **$N_{z'}$ is the density of ion with charge z' Lotz cross section for electron impact ionization rate coefficient may be written as**

$$S_z = 6.7\times10^{7}\sum_{i=1}^{x}\left(\frac{q_i\xi_i}{T_e^{3/2}}\right)\left(\frac{1}{\left(\frac{P_i}{T_e}\right)}\right)\int_{P_i/T_e}^{\infty}\frac{e^{-x}}{x}dx \quad \text{cm}^3\text{sec}^{-1} \quad (2)$$

Where, T_e - electron temperature in eV.

Dr. A. P. Pachkawade (Physics)

VOLUME - VIII, ISSUE - I- JANUARY - MARCH - 2019
AJANTA - ISSN 2277 - 5730 -IMPACT FACTOR - 5.5 (www.sjifactor.com)

16. Distribution of the Atom and Ion Densities for Finding Radial Profile in Copper Vapour Laser on Different Electron Temperature

A. P. Pachkawade
Rajarshee Shahu Science College, Chandur Rly. Dist. Amravati.
S. K. Devade
Shankarlal Khandelwal College, Akola.

Abstract

There is a large radial variation in the discharge parameters which dictate the laser output power and therefore the investigation of the radial distribution of the densities and the spectral emission in the discharge gives large amount of information [1-3] than any other type of experimental technique of procuring data related to the operation of the laser. In the present work we have divided the study of the radial profiles into two categories. The first category consists of evaluating radial profiles of the discharge parameters like electron density, electron temperature, copper atom densities, copper ion densities, etc. and the second category consists of evaluating radial profiles of spectral emission of the discharge from the knowledge of electron temperature and the electron or ion densities. The radial profile of the electron temperature in the discharge is assumed to be given by the equation.

$$T(R) = T0\ [1-(R/R0)2] \qquad (1)$$

where, T0 - Axial temperature in eV, R – Radial distance at the point in the tube and R0 – Radius of the discharge tube. The radial profile of the electron density in the gaseous laser discharge tube is also assumed to have similar shape. Initially, from the profiles of the electron temperature, the radial profile of the densities are obtained. In the second category of the radial profiles, we obtain the radial profiles of the spectral emission of the discharge from the knowledge of the electron temperature, electron and ion densities.

Keywords:- Copper Vapour Laser, laser radiation, inversion density, dimensions of the laser plasma.

Dr. A. P. Pachkawade (Physics)

National Conference on Recent Trends in Synthesis and Characterization of Futuristic Material in Science for the Development of Society (NCRDAMDS-2018)
In association with
International Journal of Scientific Research in Science and Technology

Temporal and Spatial Distribution of Output Power from Different Electron Temperature in Copper Vapour Laser

A. P. Pachkawade[1], K. P.Kadam[2], S. S. Kawar[3], S. K. Devade[4]
[1]Rajarshee Shahu Science College, Chandur Rly, Amravati, Maharashtra, India
[2]Arts,Commerence and Science College, Arvi Wardha, Maharashtra, India
[3]R.G.Rathod Science College, Murtizapur, Akola, Maharashtra, India
[4]Shankarlal Khandelwal Science College, Akola, Maharashtra, India

ABSTRACT

We have investigated the radial profiles at different times during the formation of the laser pulse. It is found that the radial profile of the spectral emission is not same at all the times during the formation of the laser pulse. The radial profile go on changing the shape as a function of time. During the formation of a laser pulse the electron temperature dose not remain same consequently the radial profile of spectral emission also change. In some cases, when the electron temperature is relatively low, the radial profiles are almost Gaussian at all the times, however the peak height goes on changing. In some other cases in a part of the beam the radial profiles are like Gaussian and in remaining part they exhibit dip non-Gaussian distribution. If the exciting pulse parameters are change the profiles remains non-Gaussian through out the formation of a beam. If the temperature is made very high beam may become annular in shape.

I. INTRODUCTION

The CVL (Copper Vapour Laser) is well recognized source of light delivering pulsed laser beam at 5106 and 5782A at the pulse repetition frequency more than 5 KHz with power levels up to about 100 watts or more. The CVL has been successfully applied in the fields like medicine (Ainsworth and Piper 1989[1]), isotope separation, under water ranging, high speed photography, micromatching[2-3,4,], drilling and cutting[2,3] etc. The high power, high energy and high precision CVL are needed by the research workers in different fields of applications.

The design calculations of the high power and high precision lasers need the detail information about the parameters like electron temperature, electron density, ion density, fractional abundances, electron impact excitation etc. The spatial and temporal profiles of these parameters, also must be known in order to design efficient and sophisticated laser systems. The technique of volumetric scaling of the laser output power also needs the detailed study of the spatial profiles of the parameters in the laser discharge. Furthermore, the investigations of the spatial distribution of the density and spectral emission (Kushner and Warner 1983[6], Carman et al. 1994[7],) in the discharge gives large amount of information about various mechanisms taking place in the discharge. With the help of the knowledge of the radial profiles the total output power calculation also may be carried out and the power distribution across the laser output beam also may be obtained. The use of the efficient data acquisation system for monitoring the discharge parameters may give the desired data for the analysis of several processes taking place in the discharge. This is because of the fact that in case of temporal and radial profiles the fundamental parameters like discharge current, the discharge voltage, the electron temperature, electron density, ion density varies from zero through their maximum values. In design of amplifier oscillator configuration system the detailed knowledge of the spatial distribution of the densities is very much important because different parts in the discharge tube have different densities and

Dr. S. S. Thakare (Chemistry)

Manohare and Thakare, IJPSR, 2019; Vol. 10(8): 3741-3745. E-ISSN: 0975-8232; P-ISSN: 2320-5148

IJPSR (2019), Volume 10, Issue 8 **(Research Article)**

INTERNATIONAL JOURNAL OF PHARMACEUTICAL SCIENCES AND RESEARCH

Received on 13 November 2018; received in revised form, 27 March 2019; accepted, 01 April 2019; published 01 August 2019

SYNTHESIS AND ANTIBACTERIAL SCREENING OF SCHIFF BASES DERIVED FROM 3-(5-BROMOTHIOPHEN-2-YL)-1-(4-CHLOROPHENYL)-1*H*-PYRAZOLE-4-CARBALDEHYDE

S. V. Manohare [*1] and S. S. Thakare [2]

Department of Chemistry [1], Adarsha Science, J. B. Arts and Birla Commerce Mahavidyalaya, Dhamangaon Rly - 444709, Maharashtra, India.
Rajarshee Shahu Science College [2], Chandur Rly - 444904, Maharashtra, India.

Keywords:

Hydrazone, Pyrazole Schiff bases, Antimicrobial activity

Correspondence to Author:
Sachin V. Manohare

Assistant Professor and HOD, Department of Chemistry, Adarsha Science, J. B. Arts, and Birla Commerce Mahavidyalaya, Dhamangaon Rly - 444709, Maharashtra, India.

E-mail: smanohare@gmail.com

ABSTRACT: A series of new Schiff bases were synthesized by condensation of 3-(5-bromothiophen-2-yl)-1-(4-chlorophenyl)-1H-pyrazole-4-carbaldehyde with different aromatic aldehydes. The 3-(5-bromothiophen-2-yl)-1-(4-chlorophenyl)-1H-pyrazole-4-carbaldehyde was prepared from 1-(1-(5-bromothiophen-2-yl)ethylidene)-2-(4-chlorophenyl)hydrazine by the Vilsmeier Haack reaction. The 1-(1-(5-bromothiophen-2-yl)ethylidene)-2-(4-chlorophenyl) hydrazine was prepared by the condensation reaction of 2-acetyl-5-bromothiophene with 4-chlorophynylhydrazine hydrochloride. The structures of newly synthesized compounds were elucidated by NMR, IR, and Mass spectral - data. Prepared Schiff bases were evaluated for antibacterial activity against four organisms: *Escherichia coli*, *Staphylococcus aureus*, *Pseudomonas aeruginosa* and *Klebsiella pneumoniae* using streptomycin as a standard drug. Agar well-diffusion method was followed to determine the antimicrobial activity. All prepared Schiff bases showed poor to good activity against test organisms. Based on the zone of inhibition results, it is observed that the newly prepared Schiff bases showed better activity against *Klebsiella pneumoniae* than *Escherichia coli*, *Staphylococcus aureus*, *and Pseudomonas aeruginosa*. Schiff base 4c showed good activity against *Pseudomonas aeruginosa*, Schiff base 4l showed good activity against *Staphylococcus aureus* and all the Schiff bases 4a-4l except 4c showed good activities against *Klebsiella pneumoniae*.

INTRODUCTION: Heterocyclic compounds have great importance in medicinal chemistry. Pyrazole is an important class of heterocyclic compounds widely used in various areas of chemistry and related sciences.

QUICK RESPONSE CODE

DOI: 10.13040/IJPSR.0975-8232.10(8).3741-45

The article can be accessed online on www.ijpsr.com

DOI link: http://dx.doi.org/10.13040/IJPSR.0975-8232.10(8).3741-45

Pyrazole derivatives have attracted much attention of chemists on account of their wide applications in medicinal chemistry.

These compounds show antimicrobial [1-3] anti-inflammatory [4, 5] antitubercular [6], antimalarial [7] insecticidal [8], antifungal [9, 10] and anticancer [11-13] activities. Schiff bases an important scaffold have attracted the interest of chemists due to wide applications in synthetic chemistry and biological point of views. They are also serving as backbone for the synthesis of various heterocyclic compounds.

Dr. S. S. Thakare (Chemistry)

SYNTHESIS OF NEW NON-SYMMETRIC SUBSTITUTED TRIAZINES AND TRIAZINE DERIVATIVES BY SN AR REACTION MECHANISM

Saroj N. Dhote*,Dr.Suresh S.Thakare
Department of Chemistry, ShriShivaji Science College, Amravati.
*E-mail :*sarojdhote3@gmail.com

Abstract
Attempts were made to carry out the laboratory synthesis of non-symmetric mono- and di- substituted 1,3,5-triazines containing amine and ether group by the action of electron donating substituent on 2,4,6-trichloro-1,3,5-triazines by aromatic nucleophilic substitution reaction mechanism(S_NAr reaction) by temperature controlled. The introduction of amino group (-NH-) and ether (-O-) linker bridge shows more promising antibacterial activity. Yield of newly synthesized compounds were quite well and their structures were confirmed by using IR, ^1H NMR and Mass spectral data.

***Key words:*cyanuric chloride, 2,4,6-trichloro-1,3,5-triazines and its derivatives,1-naphthol, spectral data.**

INTRODUCTION:

S-triazine is a six member heterocyclic compound having a chemical formula $C_3N_3Cl_3$. All the 2,4,6 - mono, di- or tri- substituted S-triazine derivatives have wide practical applications. 2,4,6-trichloro S-triazine derivatives prepared by replacement of one chlorine atom at 0-5^{0}C, second one at 60-80^{0}C.[1]Cynuric chloride is an inexpensive, commercially available reagent and is useful for the preparation of variety of S-triazine derivatives. S-triazinederivatives have received considerable attention because of their potent biological activity, for example in medicinal chemistry as anticancer, antiplasmodial and also use for the development of the treatment of diabetes, epilepsy, inflammation and analgesic.[2-4]Some of organic molecules containing S-triazine moiety have been extensively used as therapeutic agents such as Sulfasymazine, Irsoglandin, Troclosene K12 and Prometrynete.[5] During last few years the potential of S-triazine derivatives in agrochemical and medicinal properties have been subjected to investigation. Literature survey reveals that amino substituted S-triazine derivatives and thio substituted S-triazine derivatives are associated with number of pronounced antibacterial activities against gram positive (B.subtilis, B. sphaericus, S. aureusetc) and gram negative organism (E. coli, K. aerogenes, P. aeruginosa) etc.[7-9]The present work focused on stepwise design and optimization of functional groups selected to reduce the RW pharmaceutical properties based on 1,3,5-triazines as template. The results provide some insight into the structure-function relationship of these agents.[10]Here we report on the preparation of a series of new 2,4,6-trisubstituted-1,3,5-triazines via sequential substitution of the three chlorine of cyanuric chloride by N-, O- and S- centered nucleophiles.[12]1,3,5-Triazine derivatives have been known for a long period of time. They have found widespread applications in the pharmaceutical, textile, plastic, and rubber industries and are used as pesticides, dyestuffs, optical bleaches, explosives and surface active agents.[34]Globally, researchers are trying to synthesize new drugs with better pharmacokinetic and pharmacodynamics properties with fewer adverse effects.[16-18]In this work we prepared various 1,3,5-triazine derivatives by replacing one, two or three chlorine by different nucleophiles including aromatic amines, phenols and thiols by nucleophilic substitution reaction in the presence of a hydrochloride acceptor usually sodium carbonate, bicarbonate, hydroxide or tertiary amines.

ISSN (PRINT): 2393-8374, (ONLINE): 2394-0697, VOLUME-6, ISSUE-1, 2019

Mr. M. P. Waghmare (Librarian)

"RESEARCH JOURNEY" International E- Research Journal
Impact Factor - (SJIF) - 6.261, (CIF) - 3.452(2015), (GIF)-0.676 (2013)
Special Issue 110 (A): Library Science
UGC Approved Journal
ISSN : 2348-7143
February-2019

Recent Trend in N-LIST and NDL

Mr. Manoj P. Waghmare
Librarian, Rajarshee Shahu Science College, Chandur Rly. Dist. Amravati
E-mail: mpwlibrary@gmail.com

Mr. Avinash G. Yette
Dr. Arun Motghare Mahavidyalaya Kondha-Kosra, Tah: Pauni, Dist: Bhandara
E-mail: avinashyette@gmail.com

Abstract :

This research paper gives brief knowledge of NDL India & N-LIST. This Research Paper describes the various information regarding NDL India & N-LIST and there features. Various Libraries adopt new technology and techniques to implement new trend.. This topic is focused on the resent trend in e-resources with N-LIST & NDL India, need and types of e-Resources, Impact of NDL India & N-LIST on Library and Information Services, differences between N-LIST and NDL, analysis of NDL India & N-LIST users. NDL India and N-LIST are boon for the user.

Introduction:

The library services are changing rapidly in present century. With the development of e-publishing, libraries are not only focus on acquire printed reading materials but also arranging for provide access of various learning e-resources. The development of Web 2.0 and the boosted of open sources and shared use concept have focused on user generated content and applications for sharing. This has led to the fast development and popularity of electronic resources. E-Resources are occupying a significant portion of the global literature. The different types of e-resources are E-books, E-journals, E-Databases, Audio Lectures, Video Lectures, CDs/DVDs, E-conference proceedings, E-Reports, E-Maps, Images/Photographs, E-Manuscripts, E-Theses, E-synopsis, E-newspaper, Internet/Websites Newsgroups, Animation, PPT presentation etc.

The electronic resources are helpful because of their easy portability and its feature of incorporating more than one book in a single hand held device. NDL India and N-List are boon for the e-resources and users. The published materials are also available on open access platform like NDL, PDF drive, DOAJ, DOAB, etc. NDL India provides open access platform to all types of users. NDL India, PDF drive, etc. The Paper focuses on the e-resources of NDL India and N-LIST and uses.

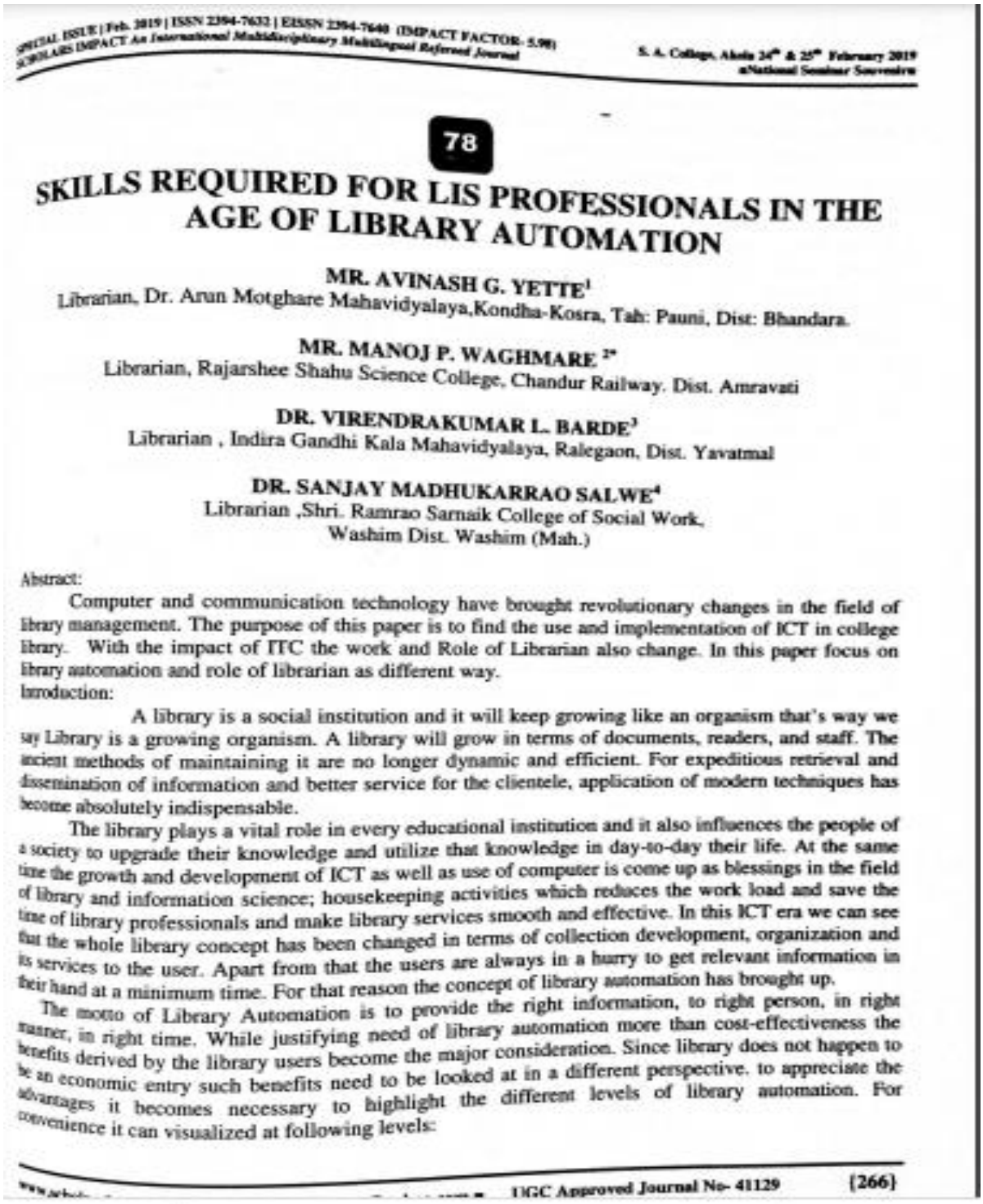
➢ **Objectives of study**

- To study of the e-resources and digital library.
- To understand and explain the use of NDL & N-LIST.
- To study the impact on the use of NDL & N-LIST?
- To study the responsibility of Librarian.
- NDL is really national asset of India.
- Difference between NDL & N-LIST.

➢ **Types of Learning E-Resources**

The types of e-resources are Book, Audio books, Biography, Bibliography, Audio Lecture, Video Lectures, Journal, Newspaper, Periodical, Magazine, Photograph, Poster, Script, Album, Almanac, Annual Report, Appendix, Article, Calendar, Catalogue, Chart, Conference

Mr. M. P. Waghmare (Librarian)



SPECIAL ISSUE | Feb. 2019 | ISSN 2394-7632 | EISSN 2394-7640 (IMPACT FACTOR- 5.98)
SCHOLARS IMPACT An International Multidisciplinary Multilingual Refereed Journal
S. A. College, Akola 24th & 25th February 2019
a National Seminar Souvenir

78

SKILLS REQUIRED FOR LIS PROFESSIONALS IN THE AGE OF LIBRARY AUTOMATION

MR. AVINASH G. YETTE[1]
Librarian, Dr. Arun Motghare Mahavidyalaya,Kondha-Kosra, Tah: Pauni, Dist: Bhandara.

MR. MANOJ P. WAGHMARE [2*]
Librarian, Rajarshee Shahu Science College, Chandur Railway. Dist. Amravati

DR. VIRENDRAKUMAR L. BARDE[3]
Librarian , Indira Gandhi Kala Mahavidyalaya, Ralegaon, Dist. Yavatmal

DR. SANJAY MADHUKARRAO SALWE[4]
Librarian ,Shri. Ramrao Sarnaik College of Social Work,
Washim Dist. Washim (Mah.)

Abstract:
Computer and communication technology have brought revolutionary changes in the field of library management. The purpose of this paper is to find the use and implementation of ICT in college library. With the impact of ITC the work and Role of Librarian also change. In this paper focus on library automation and role of librarian as different way.

Introduction:

A library is a social institution and it will keep growing like an organism that's way we say Library is a growing organism. A library will grow in terms of documents, readers, and staff. The ancient methods of maintaining it are no longer dynamic and efficient. For expeditious retrieval and dissemination of information and better service for the clientele, application of modern techniques has become absolutely indispensable.

The library plays a vital role in every educational institution and it also influences the people of a society to upgrade their knowledge and utilize that knowledge in day-to-day their life. At the same time the growth and development of ICT as well as use of computer is come up as blessings in the field of library and information science; housekeeping activities which reduces the work load and save the time of library professionals and make library services smooth and effective. In this ICT era we can see that the whole library concept has been changed in terms of collection development, organization and its services to the user. Apart from that the users are always in a hurry to get relevant information in their hand at a minimum time. For that reason the concept of library automation has brought up.

The motto of Library Automation is to provide the right information, to right person, in right manner, in right time. While justifying need of library automation more than cost-effectiveness the benefits derived by the library users become the major consideration. Since library does not happen to be an economic entry such benefits need to be looked at in a different perspective. to appreciate the advantages it becomes necessary to highlight the different levels of library automation. For convenience it can visualized at following levels:

Mr. M. P. Waghmare (Librarian)

VOLUME - VIII, ISSUE - I- JANUARY - MARCH - 2019
AJANTA - ISSN 2277 - 5730 -IMPACT FACTOR - 5.5 (www.sjifactor.com)

10. Role of NDL-India in Academic Library

Mr. Manoj P. Waghmare
Librarian, Rajarshee Shahu Science College, Chandur Rly.

Abstract

NDL India plays an important role in academic libraries. Papers discuss about the role of NDL India in academic libraries its resources: present status, registration process, features sources, objective, survey of the library. NDL-India is big boon for academic library.

Keywords: *NDL India, MHRD India, NMEICT, IDR, ICT, IIT Kharagpur, IIT Madras, E-resources, NDL India Mobile app*

Introduction

The academic libraries become information centres which are established in support and provide the require information of their parent institution, students, teacher, researcher, and other staff. The concept of library is continuously changing especially academic library. These days, with the use of ICT the quality and quantity of information resources available in library are improving. Academic Libraries are grows rapidly. With the use of ICT the resources of libraries are getting online and user can access easily that in all over the world. In India, the digital library initiatives have been sponsored by various ministries and organization. National Digital Library is the one of that which causes grate impact on the e-resources. In spite of several such initiatives, most of the challenges faced by students, teachers and general users in using digital contents remain unaddressed to a large extent. In this paper we discussed how National Digital Library boon for the academic libraries and their users. The NDL aims to form Institutional Digital Repository and gather study material into one common place. Mobile app (NDL India) is also available in NDL for users.

Objectives of study

- To study the role of NDL India in academic Libraries.
- To understand and explain the use of NDL
- To study the factor which impact on the use of NDL India in academic libraries?
- NDL is big boon for academic library.
- Role of academic Libraries to aware the users about NDL India.

Dr. A. P. Pachkawade (Physics)

'RESEARCH JOURNEY' International E- Research Journal
Impact Factor - (SJIF) – 6.261, (CIF) - 3.452(2015), (GIF)–0.676 (2013)
Special Issue 110 (I)- Physics
UGC Approved Journal
ISSN : 2348-7143
February-2019

Evaluating The Parameters Like Radial Profile As Well As Emission of A Laser Beam on Different Electron Temperature

Dr. A. P. Pachkawade
Rajarshee Shahu Science College,
Chandur Rly. Dist. Amravati(Maharashtra)
email: ashwinashwin1978@rediffmail.com

Abstract:

There is a large radial variation in the discharge parameters which dictate the laser output power and therefore the investigation of the radial distribution of the densities and the spectral emission in the discharge gives large amount of information [1-3] than any other type of experimental technique of procuring data related to the operation of the laser. In the present work we have divided the study of the radial profiles into two categories. The first category consists of evaluating radial profiles of the discharge parameters like electron density, electron temperature, copper atom densities, copper ion densities, etc. and the second category consists of evaluating radial profiles of spectral emission of the discharge from the knowledge of electron temperature and the electron or ion densities. In fact, the electron temperature is the fundamental parameter, which is determined by the cooling of the plasma electrons by the walls and the heating of the electrons due to the discharge current. The radial profile of the electron density in the gaseous laser discharge tube is also assumed to have similar shape. Initially, from the profiles of the electron temperature, the radial profile of the densities are obtained. In the second category of the radial profiles, we obtain the radial profiles of the spectral emission of the discharge from the knowledge of the electron temperature, electron and ion densities.

Furthermore, we have also computed the radial distribution of the fractional density of the copper atoms at different electron temperatures on the axis of discharge tube

Keywords:- Copper Vapour Laser, laser radiation, inversion density, dimensions of the laser plasma.

Introduction:

The gas laser medium is a mixture of electrons, atoms, ions of rare gas and active material in the discharge tube. The densities of these particles is found to be not uniform in different parts of the discharge tube. As a result of this the different parts of plasma get heated to different extent. This non uniform heating of the plasma column gives rise to the variation of plasma parameters across the discharge tube. These plasma parameters show their effect on the contribution of the excitation processes to the laser power output. Hence in order to calculate the power output delivered by a laser discharge column, it is essential to study the distribution of the densities and other parameters along the radius of the tube which are known as radial profiles. A.L. Mckenzie [1] in the year 1977, has measured the radial profiles of densities of CdI, CdII, HeI and triplet metastable state of helium in the He-CdII laser discharge. The measurement were carried out at the discharge current of 300mA and helium pressure of 5 torr and the temperature of the system was 235^{0}C.

Dr. A. P. Pachkawade (Physics)

'RESEARCH JOURNEY' International E- Research Journal
Impact Factor - (SJIF) – 6.261, (CIF) - 3.452(2015), (GIF)–0.676 (2013)
Special Issue 110 (I)- Physics
UGC Approved Journal
ISSN : 2348-7143
February-2019

Variation of electrolytic current when applied voltage during glow discharge

[1]A.P.Pachkawade, [2]K.P.Kadam
[1] Rajarshee Shahu Science College, Chandur Rly. Dist. Amravati
[2] Arts,Commerce &Science College, Arvi. Dist. Wardha
email: ashwinashwin1978@rediffmail.com

Abstract:

The dc glow discharge spectrometry is the most essential part of the electrical and spectral emission studies of the molecules, atoms and ions in the interface of solid and liquid. We measured the intensity of radiation emitted by dc glow discharge as a function of discharge current for the different electrolytes along with V-I characteristics. The voltage-ampere characteristics during a glow discharge in the atmospheric pressure gas using an electrolytic solution as the anode and metal electrode like tungsten as a cathode were carried out. Under the study of glow discharges of various elements, a monochromatic light at various wavelengths generated. Few species shows a change in the color of the glow when discharge current increased.

Keywords: interface, radiation intensity, tunneling. glow discharge,

Introduction:

Electrical and spectral characterization of the glow discharge [1-7] of the material helps in studying the chemical composition of the material. The elements in the material may be excited in the plasma [8] produced between liquid and solid interface. The neutral atoms, ionized atoms and molecules are excited and they emit characteristic spectrum and hence atomic, ionic or molecular species may be identified. Spectral study of the glow discharge [3,4,7,9] of the material helps in studying the chemical composition of the material. The solid liquid junction is formed when current is passed through the junction; a plasma film is generated along the interfaces between solid and liquid. The plasma pressure is very near to the atmospheric pressure [10,11,12]. (The plasma parameters in DC glow discharge may be generated by a current source [13].) The method is very low cost and quick results may be obtained and therefore has wide applications.

When electric discharge is passed to a conducting solution from an electrode, which is placed in the gas space above the liquid surface, reactions take place in the liquid phase and the process is referred to as "Glow Discharge Electrolysis (GDE)". The dc glow discharge continues to be the subject of spectroscopic research [15] and analytical method development. Glow discharges [14] are used for a variety of technological, physical and analytical applications, ranging from plasma etching and deposition systems in the micro-electronics industry, to lasers or even plasma monitors. Traditionally [14] dc-glow discharge optical emission spectroscopy is mainly applied in the materials sciences where it is used for bulk and surface analysis, pellets containing the adsorbed liquid and direct analysis of the liquid samples by use of adequate sample introduction techniques. Liquids can be analyzed directly at atmospheric pressures, when applying the atmospheric electrolyte cathode glow discharge cell approach with detection by emission spectroscopy as described by Cserfalvi and Mezei [3].

Dr. A. P. Pachkawade (Physics)

'RESEARCH JOURNEY' International E- Research Journal
Impact Factor - (SJIF) – 6.261, (CIF) - 3.452(2015), (GIF)–0.676 (2013)
Special Issue 110 (I)- Physics
UGC Approved Journal
ISSN : 2348-7143
February-2019

Effect of Deposition Rate on The Structural and optical Properties of Copper Sulphide Thin Films

S. S. Kawar[1]; S.V. Potdar[2]; V.S. Kalyamwar[3]; A. P. Pachkawade[4]; G.T. Lamdhade[5]
*[1]Department of Physics,Dr. R. G. Rathod Arts & Science College, Murtizapur, Dist. Akola
[2]Department of Physics, Sipna's College of Engineering & Technology, Amravati
[3]Department of Physics, BhartiyaMahavidyalaya, Amravati
[4]Department of Physics, RajashriShahuScience College, Chandur Railway
[5]Department of Physics, Vidyabharati Mahavidyalaya, Camp, Amravati
*Corresponding AuthorEmail: shashankkawar@rediffmail.com

Abstract:

We deposited chalcogenidecopper sulphidethin films on different substrates by Chemical Bath Deposition Technique. Structural, Surface Morphology and Optical properties of as deposited CuS films were investigated by XRD, SEM, and UV-VIS Spectrophotometer. The band gap was also calculated from the equation relating absorption co-efficient to wavelength. The band gap indicates the film is transmitting within the visible range and the band gaps changes because of the grain size of the CuS in the films. The physical conditions were kept identical while growing all the samples. Optical properties show that films can find application in optoelectronic devices having a high band gap ranging between minimum of Eg = 2.64 eV to highest of 2.92 eV. We also observed that, the change in preparative parameters affects the deposition rate of thin films. From the observation, it is clear that the growth rate increases as the deposition temperature, deposition time, molarities of the solution increases. It is also clear that the growth rate increases as the film thickness and grain sizes increases while band gap decreases. Depending upon these properties films are used in Optoelectronic devices.

Key words-Chalcogenide, Thin films, Deposition Parameters.

Introduction:

Copper sulfide (CuS) as an important P-type semiconductor material because of itsexcellent optical, electronic, and other physical andchemical properties. [1] Semiconductor chalcogenideshave been of much interest because of their excellentproperties and wide-range potential applications. Inparticular, as a p-type semiconductor with a band gapof 2.37 eV, copper sulfide (CuS) is a promisingmaterial with potential applications in solar energyconversion, catalysis, and sensing. Copper sulfideshave the ability to form various stoichiometries, atleast five phases of which are stable at roomtemperature: i.e., covellite (CuS), anilite (Cu1.75S),digenite (Cu1.8S), djurlite (Cu1.95S), and chalcocite(Cu2S) [1].

In this work we report the preparation of the CuS thin films having a nanometer grain size by using Chemical Bath Deposition (CBD) Technique and study the effect of deposition rate on the properties of thin films. The CBD is one of the most convenient, reliable, simplest, inexpensive method and useful for large area industrial applications as well as preparation of thin film at close to room temperatures. The technique of CBD involves the controlled precipitation from solution of a compound on a suitable substrate. The technique offers many advantages over the more established vapor phase synthetic routes to semiconductor materials, such as CVD, MBE and spray pyrolysis. Factors such as control of film thickness and deposition rate by varying the solution pH, temperature and reagent concentration are allied with the ability of CBD

Dr. A. P. Pachkawade (Physics)

VOLUME - VIII, ISSUE - I- JANUARY - MARCH - 2019
AJANTA - ISSN 2277 - 5730 -IMPACT FACTOR - 5.5 (www.sjifactor.com)

17. Characteristics of Any Laser is the Divergence of its Output Radiation which Plays Important Role in the Determination of Photon Flux

A. P. Pachkawade
Rajarshee Shahu Science College, Chandur Rly Dist. Amravati.
V. K. Jadhao
B.B.Arts, N.B. Commerence and B.P. Science College, Digras, Dist.Yavatmal.

Abstracts

The most important characteristics of any laser is the divergence of its output radiation which plays very important role in the determination of photon flux. The angle of divergence of output beam are different for Copper Vapour Laser and pulsed laser. The angle of divergence determine the photon flux when the beam is focused using focusing optics. Further the output beam is focused the diverging beam converges and get focused at the same point. In the present work, the analytical expressions are obtained for the peak power output of the CVL without mirror, the intensity of the laser radiation across the laser beam and peak power angle of divergence along the diameter of the discharge tube. The angle of divergence is determined by the absorption coefficients, initial inversion density and the dimensions of the laser plasma column in a direction perpendicular to the direction of propagation of the beam. The angle of divergence also increase with the dimensions of the plasma column in a direction perpendicular to the direction of propagation of the beam. From the calculation of peak power across the laser beam desired angle of divergence may be obtained. The half peak power angle of divergence for initial inversion density 0.2 and 0.4 are 20mrad and 30mrad respectively in Copper Vapour Laser.

Keywords:- Copper Vapour Laser, laser radiation, inversion density, dimensions of the laser plasma.

Introduction

Especially in the copper vapour laser the vapours of the chemical elements are extensively used as the active medium [1]. In some designs the bids of copper metal are used as the source of copper. The laser beam is characterized by spectral band-width, the wavelength, output power, polarization and angle of divergence. The most important characteristics of any

Dr. A. P. Pachkawade (Physics)

PUNE RESEARCH TIMES (ISSN 2456-0960)
AN INTERNATIONAL JOURNAL OF CONTEMPORARY STUDIES SPECIAL ISSUE FEB 2019

STRUCTURAL AND OPTICAL PROPERTIES OF ZnS FOR STUDY OF THICKNESS DEPENDENT THIN FILMS

S. K. DEVADE[1], A. P. PACHKAWADE[2]

[1]Department of Physics, Shankarlal Khandelwal College, Akola. (MS) INDIA.
[2]Dept of Physics Rajarshi Shahu College Chandur Relway Dist Amravati (MS) INDIA

Abstract: *Zinc sulphide (ZnS) thin films were deposited on glass substrate using relatively simple chemical bath deposition. method (CBD), using the mixed aqueous solution of zinc sulphate, thiourea and ammonia. The ammonia was used as the complexing agents. The preparative parameters are concentration, pH of solution, deposition time and temperature has been optimized. Thin films of ZnS with different thickness 100-350 nm were prepared by changing the deposition time from 20–100 minutes at 80^{0}C temperature. The effect of film thickness on structural and optical properties was studied. The thin films were characterized by using X-ray diffraction (XRD) and Fourier transformation, Infrared spectroscopy (FTIR). The effect of thin films thickness on optical and structural properties has been studied.*
Keywords: *Zinc Sulfide, Thin films, structural and optical properties*

Introduction

Zinc Sulfide ZnS is a semiconductor with large band gap which becomes highly efficient luminescent material belongs to II-VI group. ZnS thin films have also been widely studied due to their employment in an antireflection coating for heterojunction solar cell(1), for light emitting diode (2,3) and other optoelectronic device such as blue and green emitting laser diodes (4),electro luminescence devices and photovoltaic cells which enable wide application in the field of displays(5,6), sensors and lasers(7) There has been growing interest in developing techniques for preparing semiconductor nano particles and films.

ZnS films can be prepare by several techniques such as thermal evaporation (8, 9), spray pyrolysis (10_13) , molecular beam epitaxy (14), RF reactive sputtering (15), Pulsed Laser Deposition, Chemical bath deposition technique. In present investigation ZnS thin films have been deposited using chemical bath deposition method.The structural and optical properties of the deposited ZnS thin films were studied.

NATIONAL CONFERENCES (NCNA - 2019 & IPRP - 2019) 14 FEB 2019
ECIAL ISSUE –FEB 2019 www.puneresearch.com/times (MS) INDIA
IPACT FACTOR 3.18) INDEXED, PEER-REVIEWED / REFEREED INTERNATIONAL JOURNAL

Dr. S. S. Padhen (Chemistry)

'RESEARCH JOURNEY' International E- Research Journal
Impact Factor - (SJIF) - 6.261, (CIF) - 3.452(2015), (GIF)-0.676 (2013)
Special Issue 110 (B) : Chemistry
UGC Approved Journal
ISSN : 2348-7143
February -2019

Ultrasonic Measurements of (2e)-1-(4-Thiocarbamidophenyl)-3-(3,4-Dimethoxyphenyl)Prop-2-En-1-one At 60°c in 70% Dioxane-Water Mixtures.

D.T. Tayade[a],
a:- Department of Chemistry,
Government Vidarbha Institute of Science and Humanities,
Amravati 444 604. Maharashtra State, India.

S.S. Padhen[b],
b:- Department of Chemistry,
R.S.Sci. Collge Chandur (Rly),
Dist. –Amravati 444904 (MS) India.

S.A.Waghmare[c]
c:- Department of Chemistry,
Ghulam Nabi Azad Arts, Commerce & Science College,
Barshitakli, Dist-Akola 444 401(MS) India
*:- corresponding author
Email: - siddharthwaghmare2011@gmail.com

Keywords: (2E)-1-(4-thiocarbamidophenyl)-3-(3,4-dimethoxyphenyl)prop-2-en-1-one, ultrasonic measurements.

Abstract:-

Chalcone and thiourea nucleous containing drugs created their own identity in the drugs, pharmaceutical and medicinal sciences. The results obtained from interferometric measurements of any drug directly through light on solute-solvent, solute-solute- solvent, solute-solvent-solvent interactions, the dipole association of compound, intermolecular attraction between solute and solvent, dielectric constant of medium, polarizability and mutual compensation of dipoles. These ultrasonic parameters are useful for predicting the absorption of drug, its transmission, stability, activity and ultimatly drug effect. This is a base of pharmacodynamics of any drug.

Considering density and sound velocity of substituted thiocarbamidochalcone were measured at 60°C in 70% dioxane-water mixtures at various molar proportions.

Introduction:

The thiocarbamido compounds initiate the new branches of development in the medicinal, pharmaceutical, agricultural, biochemical and industrial fields[1,2]. To determine the pharmacokinetics and pharmacodynamics of any drug in medicinal and drug chemistry, the interferometric measurements play an important role[3-5]. Theoretically, drug activity and drug effect can be easily determined by knowing solute-solvent interactions.

Interferometric measurement method is very useful, handy, easy and suitable for studying solute-solvent interactions, which indicates Drug activity and drug effect in vivo. In the present investigation adequate theoretical approaches and methods are used for physiochemical interactions of solution with precise ultrasonic velocity measurements in minimum volume of liquids[6,7]. Ultrasonic study of fluids is confined to the determination of hydration number and compressibility[8-10]. The use of ultrasound was proved to be useful probe for generating more information on oregano metallic chemistry, biotechnology, polymerization medicinal[11-13].

Material and Methodology:

Carbon dioxide free, double distilled water was used. Extra pure (E. Merck) dioxane was further purified by the prescribed procedure[14] and used for preparation of drug solutions. Ethylthiocarbamidochalcone was prepared by known literature method[15].

Dr. S. S. Padhen (Chemistry)

JASC: Journal of Applied Science and Computations ISSN NO: 1076-5131

AT CONSTANT CONCENTRATION VISCOMETRIC MEASUREMENTS OF 1-PHENYL-3-[4-(3-ETHYLIMINO-1,2,4-DITHIAZOLO)AMINOPHENYL] PROP-2-ENE-1-ONE IN 70% ETHANOL-WATER MIXTURE USINGVARIOUS TEMPERATURES

S.S. Padhen[a], S.A.Waghmare[b]

a:-Department of Chemistry, Rajarshee Shahu Science College Chandur (Rly), Dist.-Amravati, 44904. Maharashtra, India.

b:-Department of Chemistry, G.N. Azad Arts, commerce & Science College, BarshitakliDist: Akola 444 401. Maharashtra, India.

Email: -

Abstract:

Present investigation Viscometric measurements was carried out of 1-phenyl-3-[4-(3-ethylimino-1,2,4-dithiazolo)aminophenyl] prop-2-ene-1-one at various temperaturesby keeping the constant concentration. Also to determine the effect of dilution of the solvent and the solute-solvent interaction of drug in current times in our laboratory..

Keywords.- Ethanol-Water mixture, Viscometric measurements, 1, 2, 4-Dithiazole etc.

I. INTRODUCTION

The heterocyclic compounds are very widely distributed in nature and very essential to living organisms. Hence viscosity measurements play a crucial role in biochemical, agricultural, pharmaceutical, medicinal, and industrial and drug sciences[1-4]. Viscosity is one of the important physical property of liquid. The liquids are viscous in nature due to the shearing effect in the liquid which is the movement of liquid layers over each other. Viscometric studyproviding important information regarding solute-solute and solute-solvent interaction in an aqueous and in non-aqueous solution. Drug behavior like absorption, transmission and its effect will directly relate to its viscosity measurements and solvent interactions in the human framework.

Literature survey clearly revealedthat the drugs which are superlatively admirable for meticulous diseases demonstrate to be non-active for those particular diseases as pathogens undergoprompt evolutionary phenomenon[5-6]. This fact challenges the researchers and chemists to blend innovative drug for such diseases. Substituted 1,2,4-dithiazolo nucleus containing drug create their own identity and importance in drug and pharmaceutical chemistry[7-9].All these factsgather in mind it became a topic of great interest to carry out the viscometric measurements of1-phenyl-3-[4-(3-ethylimino-1,2,4-dithiazolo)aminophenyl] prop-2-ene-1-one by varying temperatures. Drug effectiveness was also proved helpful by such kind of study.

II. EXPERIMENTAL

A.R. grade chemicals and double distilled water were used for all types of analysis. We used MechanikiZaktadyPrecyzyjnej Gdansk balance (Poland make [±0.001gm]) to weigh our compounds. Ostwald's viscometer was used for measure viscosity of liquid. It was kept in Elite thermostatics water bath and temperature variation was maintained at 28°C (±0.1) for each measurement. Bicapillary with a 1 mm internal diameter was used for determined densities.Maintaining thermal equilibrium in between viscometer and water bath required sufficient time.

The present study deals with the viscosity investigation of 1-phenyl-3-[4-(3-ethylimino-1,2,4-dithiazolo)aminophenyl] prop-2-ene-1-oneat 0.1M concentration in 70% ethanol-water system separately at varying temperatures. We always usedfreshly prepared solutions of a solute in the current study. The viscometric readings were taken as described in literature

III. OBSERVATIONS AND CALCULATIONS

Molecular interactions in terms of β-coefficient of solute isfigured with the help of data obtained in our work. The results obtained are stated in **Table No. 1**. According to Jone's-Dole equation, $(\eta_r-1)/\sqrt{C} = A+B\sqrt{C}$ at different temperatures keeping the concentration 0.1 M. A and β-coefficient values calculated are enlisted in **Table No.2.**

Dr. R.N. Bhagat (Physics)

International Journal of Advanced Science and Technology
Vol. 28, No.20, (2019), pp. 1242-1246

Synthesis of Nano-Cadmium Sulfide Using Urea as a Capping Agent

Roshani Bhagat[1], Shital Bhad[2], Vijaya Sangawar[3], Nilesh Thakare[4], Swati Aswale[5]

[1*]*Asst. Prof., Department of Physics, Rajarshee Shahu Science College, Chadur Railway,*
[2]*Asst. Prof., Arts, Commerce and Science College, Amravati, India*
[3]*Professor, Department of Physics, GVISH, Amravati, India*
[4]*Asso. Prof., Department of Engg. Physics, PRPCEM, Amravati, India*
[5]*Asst. Prof., D.Y. Patil College of Engineering, Akurdi, India*

Abstract: *Cadmium sulfide has been synthesized using chemical solution method having average particle size 20 nm. CdS nanoparticles are prepared by using urea as a capping agent and variety of techniques like X-Ray Diffraction (XRD), Tunning Electron Microscopy (TEM), and Fourier Transform Infrared Spectroscopy (FTIR) are used to carry out structural characterization of the nanoparticles.*

Keywords: *Nano-CdS, Urea, X-ray diffraction, TEM, FTIR*

I.INTRODUCTION

In recent years, semiconductor nanocrystals have attracted much attention in both fundamental research and technical applications, owing to their unique size-dependent optical and electronic properties [1-3]. Large scale synthesis of such semiconductor nanoparticles such as solid powder is critically important not only for the study of their physical properties but also for industrial allocation in the area of catalysis, photo catalysis and microelectronics [4-5]. CdS is from one of the most important group II-VI semiconductors having band gap energy 2.43 eV and widely used in the application of optoelectronic devices, preparation of cadmium-coated baths, manufacture of paint pigments and to study its properties [4]. Many organic passivators such as 1-thioglycerol, thiophenol [6], thiourea [7] and mercapto acetate [8] and so on, are toxic, which will pollute the environment if large-scale nanoparticles are produced. The basic aim of the present research work is to synthesis CdS nanoparticles on large scale, which is environmentally non-toxic and controllable, using urea as one of the best capping agent and investigated its electronic properties [9].

II.EXPERIMENTAL

II.1 MATERIALS

All the reactants and solvents used in this work were of analytical grade and used without any further purification. Cadmium nitrate (Sd fine–Chem limited) and Sodium sulphide (Sd fine-chem limited) were used as received. NaOH was obtained from Supreme Petrochemicals Private Limited Mumbai, India and used without further treatment. Urea was purchased from (Sigma-Aldrich). Deionised water was used as a solvent.

II.2 CHARACTERIZATION

The powder X-ray diffraction (XRD) was made on a PHILLIPS HOLLAND PW 1710 X-ray diffractometer using CuKα radiation (λ=0.154056 nm). The morphology of nanoparticles was observed with a TEM, Hitachi H-7100 Transmission Electron Microscopy. The dried nanoparticles mixed with KBr were characterized with Fourier Transform Infrared Spectroscopy (FTIR) on SHIMADZU. UV-Vis absorption spectrum of the nanoparticles was recorded at room temperature with a SHIMADZU (visible spectrometer) UV-1700 series. All measurements were made under ambient conditions

Dr. R.N. Bhagat (Physics)

International Journal of Advanced Science and Tec
Vol. 28, No.20, (2019), pp. 12

To Study AC electrical conductivity of TiO2 doped polyaniline.

[1*] N R Thakare ,[2]Swapnil Sawant ,[3]R. N. Bhagat,[4]S D wakde
[1,2,3,4]Dept of Physics,
[1,4]P. R. Pote (Patil) C.E.M., [2]M.F.Arts Commerce and S.C Science College Jarud
Amravati, India
[3]R.Shahu Science College, Chadur Railway, India.

Abstract
In the present research work we make a pallet of PANI+TiO2 and then we determined the AC ele conductivity of polyaniline and polyaniline doped TiO2. Effect of Temperature on A.C. conduct varying frequency is also studied.

1. Introduction.

The synthesis of conducting polymer has been accomplished by oxidizing or reducing process through chemical doping or electrochemical doping [1,2] various application of conducting polym been proposed as transducer of biosensor gas sensor transistor[3,4] Polyaniline (PANI) contin attract considerable attention because its electrical and optical properties can be changed by oxidati protonation of the amine nitrogen atoms. The protonation and deprotonation and various other pl chemical properties of polyaniline is due to the presence of the –NH- group. [5 6] There are reports of polyaniline found in the literature over the decades about the structure and constitutional of aniline polymerization[7-10]. The primary and secondary structure describes the connectivity atoms and the three dimensional shape due to short range non- bonded interactions, such as ba twisting respectively our aim is to determine the AC electrical conductivity of PANI doped TiO2.

2. Materials Used and Preparation of samples

2.1: Polyaniline (PANI):-

Chemical formula :(C6H7N)n

Polyaniline (PANI) is a conducting polymer of the semi-flexible rod polymer family. Althou compound itself was discovered over 150 years ago, only since the early 1980s polyaniline captu intense attention of the scientific community. This interest is due to the rediscovery of high el conductivity. Amongst the family of conducting polymers and organic semiconductors, polyanil many attractive processing properties. Because of its rich chemistry, polyaniline is one of th studied conducting polymers of the past 50 years.

2.2: Preparation of samples.

"Standard"preparationofpolyaniline

Project participants followed the same instructions to oxidize 0.2 M aniline hydrochloride with ammonium peroxydisulfate in aqueous medium. Aniline hydrochloride (purum; 2.59g, 20mmo dissolved in distilled water in a volumetric flask to 50 mL of solution. Ammonium peroxyd (purum; 5.71 g, 25 mmol) was dissolved in water also to 50 mL of solution. Both solutions we for 1 h at room temperature (~18–24 °C), then mixed in a beaker, briefly stirred, and left at rest t merize. Next day, the PANI precipitate was collected on a filter, washed with three 100-mL port

Dr. A.P.Thakare (Chemistry)

ScienSage

Journal of Advanced Scientific Research

Available online through http://www.sciensage.info

ISSN 0976-9595

Research Article

SYNTHESIS, SPECTRAL CHARACTERIZATION, THERMAL AND BIOLOGICAL STUDIES OF CU(II), CO(II), TH(IV) AND ZR(IV) COMPLEXES WITH SYMMETRIC THIOCARBOHYDRAZONE LIGAND

P K Deshmukh*, A P Thakare and P R Mandlik

Department of Chemistry, Shri Shivaji Science College, Amravati

**Corresponding author: pratikdeshmukh212@gmail.com*

ABSTRACT

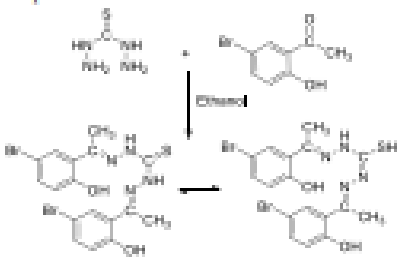
The thiocarbohydrazone Schiff base ligand (LH_2) was synthesized by the condensation of thiocarbohydrazide and 1-(5-bromo-2-hydroxyphenyl)ethanone. Such Schiff base ligand with heteroatoms such as nitrogen, oxygen and sulphur as donor atoms have unique tendency to conjugate with metal ion for the formation of metal complexes. By knowing this fact, a series of Cu(II), Co(II), Th(IV), and Zr(IV) metal complexes were synthesized from (H_2L) Schiff base ligand and characterized by using spectroscopic techniques.

IR spectra reveal that co-ordination of the ligand with metal ion resulting into mononuclear complexes. The ligand mainly coordinates through the hydroxyl oxygen and azomethine nitrogen to give five membered rings in some cases. Molar conductance values of synthesized metal complexes in DMF indicate the nonelectrolytic nature of the complexes. From the observed magnetic moment and electronic spectral data, probable structures for the complexes have been proposed. The thermal behavior of ligand and metal complexes shows the presence of lattice and the co-ordinate water around their co-ordination sphere. The synthesized Schiff base ligand and its complexes were also tested for their antimicrobial activity against *E. Coli, S. aureus, S. epidermis, and K. pneumoniae.*

Keywords: Thiocarbohydrazide, Metal Complexes, IR, Electronic Spectra, Freemann-Carol

1. INTRODUCTION

Schiff base complexes of transition metals are of particular interest to inorganic chemists because of their structural, spectral and chemical properties are often strongly dependant on the nature of ligand structure. Study of compounds of oxygen, nitrogen and sulphur are extensive as it includes effects of donor sites and electron delocalisation in transition metal complexes [1]. Field of schiff base complexes is fast developing because of the wide variety of possible structures for the ligands [2]. Antimicrobial activities of thiosemicarbazones had been studied comparative to thiocarbohydrazones [3]. Thiocarbohydrazides can exist in thioenol and thioketo forms and as other sulphurs donors can act as bridging sites allowing various structural possibilities with different stereo-chemistries [4, 5]. There is no report on the synthesis of metal complexes with the schiff base derived from thiocarbohydrazide and 1-(5-bromo-2-hydroxyphenyl)ethanone. As part of our investigation we have synthesized the Schiff base ligand LH_2 **(Scheme 1)** and its Cu(II), Co(II), Th(IV) and Zr(IV) complexes. The antimicrobial thermal analysis of compounds was examined in present study. Most Schiff bases are chemically unstable and show 'tautomeric' inter-conversions therefore, successful application of Schiff bases requires a careful study of characteristics their metal complexes.



Scheme 1: Synthesis and tautomeric behaviour of the H_2L ligand

2. MATERIALS AND METHODS

2.1. Materials and physical measurements

All the chemicals were obtained from S D Fine and Aldrich and were used without further purification. The solvents were of analytical grade and purified by standard methods. The C, H, N elemental analyses were

Dr. A.P.Thakare (Chemistry)

SciencSage

Journal of Advanced Scientific Research

Available online through http://www.sciencesage.info

ISSN
0976-9595
Research Article

SYNTHESIS, STRUCTURAL ANALYSIS AND PHOTOPHYSICAL PARAMETERS OF ISOXAZOLINE DERIVATIVES

Yogita Thakare*[1], Amol Thakare[2]

[1]*Department of Chemistry, Shri Shivaji Science College, Amravati, Maharashtra, India*

[2]*Department of Chemistry, Rajarshee Shahu Science College, Chandur Rly, Maharashtra, India*

*Corresponding author: yogitathakare_2007@rediffmail.com

ABSTRACT

In the present work, series of 5 substituted isoxazolines have been synthesized by reacting appropriate chalcone with hydroxylamine hydrochloride. The structures of synthesized compounds were confirmed by IR, NMR and Mass spectral analysis. The aim of this work is to synthesize and characterize new isoxazoline derivative. Also study was extended to antimicrobial activity, photophysical property, viscometric measurement and its thermodynamic parameter like Entropy, Enthalpy and Gibbs free energy at different concentrations. The maximum absorption of synthesized derivative -3(4' methyl phenyl)-5-(furan) isoxazoline was found at 311nm. The study shows positive value of ΔS, negative value of ΔG and positive value of ΔH which confirms that the reaction is endothermic and spontaneous. It was also observed that viscosity of solution increases with increase in the concentration of solution and positive value of B-coefficient may attribute to strong solute-solvent interaction. On the other hand value of A-coefficient is almost negative which indicates weak solute-solute interaction.

Keywords: Antimicrobial, Photophysical, Viscometric, Thermodynamics, Isoxazoline Derivative

1. INTRODUCTION

The heterocycles are important due to their chemical, biological, and technical significance. Heterocyclic compounds occur widely in naturally and non-naturally occurring compounds [1]. Heterocyclic compounds particularly five or six member ring compounds have occupied the first place among various classes of organic compounds for their diverse biological activities. The heterocyclic chemistry is composed of 5-membered, 6-membered and fused heterocycles. These compounds possess one or the other chemotherapeutic or pharmacological activities [2]. Different 5 substituted isoxazoline derivatives were synthesized by cyclization of chalcone intermediates in presence of hydroxylamine hydrochloride. Isoxazolines are the dihydro derivatives of isoxazoles and exhibits tautomerism in the formation of isoxazoline. It was assumed that unsaturated ketoxime may be intermediate. It may be considered that isoxazolines are not formed by direct ring closure of syn-oxime, but by the way of either oximio-oxime or disubstituted hydroxylamines. They have been synthesized by the interaction of chalcone and hydroxylamine and aqueous hydrochloride and aqueous KOH in ethanol medium.

Some isoxazolines possess anti-inflamatory, anti-tuberculosis, antinociceptive activity [3].The five member heterocyclic compounds containing nitrogen and oxygen atoms have been synthesized for their potentials in exhibiting some kind of activities and also for correlating it with its structure. The structural moieties such as isoxazolines have been found to be responsible for their various physiological, biological and agricultural activities. In recent years, attention has increasingly been given to the synthesis of isoxazoline derivatives as a source of new antibacterial agents. The synthesis of novel isoxazoline derivatives remain a main focus of medicinal research [4].

Isoxazolines are biologically active, synthetically useful and important heterocycles having a wide role in medicinal chemistry. Isoxazolines are also reported to possess good antimicrobial, analgesic and anti-inflammatory activity [5]. Isoxazolines have played a crucial role in the history of heterocyclic chemistry and has been used extensively important pharmacophores and synthons in the field of organic chemistry. In view of the biological activities some isoxazoline derivatives in this study have been synthesized and screened for their

Dr. R. V. Kene (Mathematics)

Aryabhatta Journal of Mathematics & Informatics Vol. 12, No. 2, July-Dec., 2020
Double-Blind Peer Reviewed Refereed International Journal ©www.abjmi.com
ISSN (Print) : 0975-7139
ISSN (Online) : 2394-9589

SOME PROPERTIES OF LOCAL FRACTIONAL MELLIN - FRACTIONAL DOUBLE LAPLACE TRANSFORM

R.V. Kene
Assistant Professor, Rajarshee Shahu Science College, Chandur Rly, Dist. Amravati (Maharashtra)
E-mail : rekha.korpe@rssc.edu.in

ABSTRACT

In this article we introduce definition of Local Fractional, Mellin-Fractional Double Laplace Transform of real order $\propto, 0 < \propto \leq 1$ Some main properties for Local Fractional Mellin-Fractional Double Laplace Transform are established. Further convolution theorem for Local Fractional Mellin-Fractional Double Laplace Transform have also been presented.

Keywords: local Fractional Mellin -Fractional Double laplace transform, local fractional derivatives, Fractional calculus.

1 INTRODUCTION

There are various integral transforms in the literature which are used in astronomy, physics and also in engineering. The integral transforms were vastly applied to obtain the solution of differential equations; therefore there are different kinds of integral transforms like Mellin, Laplace, Fourier and so on.

In the recent years, Mellin transform is found to be very useful in signal processing as a tool to investigate scale invariance. Altes[1] had applied Mellin transform for mammalian hearing. V.D.Sharma and P.B.Deshmukh [2] has explained operational Transform Formulae for two dimensional fractional Mellin Transform. Hence number of extensions of Mellin transform was studied by different mathematicians. Mellin Transform acts as a basic tool to analyze the behavior of many important functions in mathematical physics mainly in electronics and has many applications as in quantum calculus, electromagnetic stress distribution, signal processing, optics, pattern recognition, cryptographic scheme, navigator, radar etc. The transform is also applied in solving fractional differential equations.

Fractional calculus is a generalization of the classical calculation and it has been used successfully in various fields of science and engineering. In fact, there are new opportunities in mathematics and theoretical physics appear, when order differential operator or operator becomes an integral arbitrary parameter. The fractional calculus is a powerful tool for the physical description systems that have long term memory and long term spatial interactions see Podlubny (1999), Miller and Ross (1993), Hilfer (2000), Kilbas et al.(2006).

Dr. R. V. Kene (Mathematics)

© 2021 IJRAR January 2021, Volume 8, Issue 1 www.ijrar.org (E-ISSN 2348-1269, P- ISSN 2349-5138)

INVERSION FORMULA FOR LOCAL FRACTIONAL MELLIN –FRACTIONAL DOUBLE LAPLACE TRANSFORM

R.V.Kene
Assistant Professor,
Department of Mathematics
Rajarshee Shahu Science College, Chandur Rly, Dist:-Amravati (Maharashtra)

Abstract: – Integral transforms appears in many fields of applied mathematics, physics, and engineering. There are several kinds of integral transforms and they have wide applications in today's technology. Recently many researchers studied some properties of applications of Mellin transform in fractional sense. Mellin transform is closely connected to Laplace transform and Fourier transform. In this paper Local Fractional Mellin-Fractional Double Laplace transform is defined. Inversion formula for the Local Fractional Mellin-Fractional Double Laplace transform is proved.

Key Words: – Laplace transform, Mellin Transform, Local Fractional Mellin Transform, Fractional Double Laplace and Local Fractional Mellin –Fractional Double Laplace Transform.

I. **INTRODUCTION:** – Integral transform is one of the well known techniques used for function transformation. While solving partial differential equations, as per need many new integral transforms are developed. Extension of some transformations to generalized functions has been done from time to time and their properties have been studied by various mathematicians. Number of double transformations has been developed by many mathematicians like Fourier-Hankel transformation [1], Mellin-Whittaker transform [2] etc. In [3] and [4] we have investigated the properties and inversion for Mellin-Whittaker transform and fractional Mellin Whittaker transform. Local fractional calculus [5 – 7,9,10,14 – 21,23,24] is a generalization of differentiation and integration of the function defined fractal sets and it has been used successfully in various fields of science and engineering. There are many definitions of local fractional derivatives and local fractional integral (also called fractal calculus)[5 – 13,17 – 19,21 – 26]. Here we write down Gao-Yang-Kang local fractional derivative by [18 – 21,23 – 26].Now I have defined a new combination of integral transform namely Local Fractional Mellin –Fractional Double Laplace Transform. Along with the definition its properties are proved in [27]. Now in this article I have investigated the Inversion formula for Local Fractional Mellin-Fractional Double Laplace transform.

II. **Notations:**

Through this article, we denote Local Fractional Mellin-Fractional Double Laplace transform by using the symbol $M_\alpha L_\beta^2\{f(x,y,t)\} = F_{\alpha,\beta}^2[s,p,q]$

This paper is organized as follows.

The second section is devoted to definition of Local Fractional Mellin-Fractional Double Laplace transform.

In the third section inversion formula for Local Fractional Mellin-Fractional Double Laplace transform is established.

III **Local Fractional Mellin- Fractional Double Laplace Transform:**

Definition: If $f(x,y,t)$ is a function where $x,y,t > 0$ then Local Fractional Mellin-Fractional Double Laplace transform of $f(x,y,t)$ is defined as

$$M_\alpha L_\beta^2\{f(x,y,t)\} = F_{\alpha,\beta}^2[s,p,q] = \frac{1}{\Gamma(1+\alpha)}\int_0^\infty\int_0^\infty\int_0^\infty x^{\alpha(s-1)}E_\beta(-(py+qt)^\beta)f(x,y,t)(dx)^\alpha(dy)^\beta(dt)^\beta \text{----------(1)}$$

Where $s,p,q \in C$ and $E_\beta(y)$ is the Mittage- Leffler function.

By using the Mittage-Leffler property then we can rewrite the formula (1) as the following

$$M_\alpha L_\beta^2\{f(x,y,t)\} = F_{\alpha,\beta}^2[s,p,q] = \frac{1}{\Gamma(1+\alpha)}\int_0^\infty\int_0^\infty\int_0^\infty x^{\alpha(s-1)}E_\beta(-(py)^\beta)E_\beta(-(qt)^\beta)f(x,y,t)(dx)^\alpha(dy)^\beta(dt)^\beta$$

IV **Inversion formula for Local Fractional Mellin-Fractional Double Laplace transform:**

We shall now derive an inversion theorem for Local Fractional Mellin-Fractional Double Laplace transform.

The proof of the inversion formula requires the following definition and Theorem:

4.1 **Definition:** - Two variables delta function $\delta_\beta(y-a,t-b)$ of fractional order β, $0 < \beta \le 1$ can be defined as formula

$$\int_a\int_a g(x,y)\delta_\beta(y-a,t-b)(dy)^\beta(dt)^\beta = \beta^2 g(a,b) \text{----------(1)}$$

4.2 **Example:** – We can obtain fractional double Laplace transform of $\delta_\beta(y-a,t-b)$ as follows

$$L_\beta^2[\delta_\beta(y-a,t-b)] = \int_0^\infty\int_0^\infty E_\beta(-(py+qt)^\beta)\,\delta_\beta(y-a,t-b)(dy)^\beta(dt)^\beta$$
$$= \beta^2 E_\beta(-(pa+qb)^\beta) \text{----------(2)}$$

Dr. M. J. Keche (Botany)

High Technology Letters ISSN NO : 1006-6748

"MORPHOLOGICAL VARIABILITY IN GAMMA IRRADIATED WILD PEA"

*Minal Jeevan Keche
Department of Botany Rajarshee Shahu Science College Chandur Rly,DistMaharastra 444604

ABSTRACT

The gammaradiation has been found to affect the size and weight of plants. In many radiobiology reactions, the effect of given dose depends upon the intensity of radiation or manner in which the total dose is fractioned (i.e the time intensity factor). The gamma rays are known to influence plant growth and development by inducing cytological, genetical, biochemical, physiological and morphogenetic changes in cells and tissues. It was reported that higher exposures were usually inhibitory, whereas lower exposure were sometimes stimulatory.It was pointed out that the results from one species or verities should not be applied to others as different types of responses are to be expected in different plants or even at different stages of development in same plant.Gamma radiation is used to induce mutation in order to generate variability in morphological trait.

Key words:*Gamma radiation, Morphological traits, Genetic variability*

INTRODUCTION

Field pea (*Pisum sativum* L.) is one of the oldest domesticated crop plants that have versatile uses in both food and feed. The dry seeds typically contain 19-27% protein and are relatively free of anti- nutritional substances (Petterson *et al.*, 1975). As Grain legume, it has added benefit of improving soil nitrogen status and contributing to the yield and protein content of the succeeding cereal crop in rotation. Field peas for food are commonly divided into five seed types. Round white seeded type is preferred in whole seed preparation but are also milled. Dun type seed is characterized by green to brown seed coat and yellow cotyledon and this has been traditionally exported for milling to the Indian sub- continent from Australia. Dun type is also preferred for sprouting in the South East Asia. Blue pea has translucent seed coat and green cotyledon giving it a slightly bluish appearance. This type is used in soups and as dry green dal. Maple seed type has brown seed coat and yellow cotyledons but seed coat is mottled with light colored spots. Maple type is used as bird feed and attract premium for

Dr. M. J. Keche (Botany)

International Journal of Science and Research (IJSR)
ISSN (Online): 2319-7064
Index Copernicus Value (2013): 6.14 | Impact Factor (2015): 6.391

Estimation of Soluble Protein by Bradfords Method in Gamma Radiated (wild) Pea

Keche .M .J

Department of Botany, Rajarshee Shahu Science College, (Chandur Rly)

Abstract: *In recent year grain legume play important role and primary role in the search of protein owing to the high protein content of seed ranging from 20% to 40% in pea. They can therefore be considered good substitution to animal protein in human diet, especially in the third world. Howe ever the seed storage protein of these legume containing amino acid and plant breeding have to consider this problem in any improvement programs. Mutagenesis started utilized experiment mutagens in altering seed protein in many cereals both quantitatively and qualitatively with view to bridge protein gap cause of malnutrition.*

Keywords: Mutagen, gamma radiation, seed protein

1. Introduction

Field pea is significant pulse crop in both India and Australia. There are a number of similarities that include nationally co-ordinate breeding programs, moisture stress in rained crops, low yield significant of powdery mildew and an interest in developing lodging resistant varieties. Peas are of great nutritional importance due to their high content of protein complex carbohydrates, dietary fibre mineral, vitamins and antioxidant compounds.

The principal of applied mutagenesis through initiated nearly 16 year ago in legume has contributed insignificantly in induced high protein mutant beans among legume shows considerable range of variability (Amirishi and Tavakolib 1970, Rutgure, 1971; Woolfe and Hamblin, 1983) their adaptedable nature , mutation breeding programme for higher protein content and quality under the assistance from university grant commission (Grant No F-23-118179 (sr II) was intimated in 1979 in *Phaseolouse vulgaries*.

Increased interests in plant proteins for feed and food led to the evolution of field pea as high protein crop such as soybean are processed into flour, protein concentrated and protein isolated suitable for various foods brevages sales of soya protein isolated containing 90% protein are expanding because of its higher protein content , functionally , nutritional properties and improved flavour.

Germplasm is vital source in generating new plant types having desirable traits that help in increasing crop quality and production as well thus improved level of human nutrition.

The use of mutagenic agent to induced variability has been a practical tool especially where natural variability is not available. Many investigators used make used of gamma radiation used to induce mutation to generate variability in morphological traits and electrophoretic profile of seed storage protein.

2. Material & Methods

Coommassive brilliant blue G-250 is one of the members of dyes that combine with protein to give an absorption maximum in the region of 595 nm wave length. The practical advantages are that the reagent is simple to prepare that colour develop rapidly and is stable. Although it is sensitivity down to 20ng protein per cm it is only relative method as the amount of dyes binding appear to vary with the content of basic amino acids residues in the proteins .This makes the choice of standard difficult (Bradford, 1976).

3. Reagents

a) Standard protein solution
b) Protein reagents (0.01%)

a) Standard protein solution:
Dissolve 25mg of bovin serum albumin in 0.15M Nacl and make up the volume to 25ml (1mg/ml).

b) Protein reagents (0.01%):
Dissolve 100mg of comassive brilliant blue G-250 in 50ml of 95% alcohol and add 100ml of 85% (wt/vol) phosphoric acid and dilute to 1 liter in water.

4. Method

1) Pipette out 0.01, 0.02, 0.04---------- 0.1ml of standard protein solution . Make up volume in each tube to 0.1 ml with and phosphate buffer 0.1 ml of buffer alone serves as the blank.
2) Add 5ml of protein reagent and mix thoroughly by inversion or vortexing.
3) Measure the absorbance at 595 nm after 2min and before 1 hour against the reagent blank.
4) Plot a standard graph and calculate the amount of protein in unknown, sample treated in same manner.

Preparation of seed sample
For extraction of protein individual seeds irradiated with particular gamma doses were ground to fine powder with morial and pestle. To extract protein in 0.01 gm of seed flour, 400ml of the protein extraction buffer (0.05 M tris-HCl, 0.2%, SDS, 5Murea and 1%b- Mercaptoethanol) was added to tube and mixed well by vortex . Then centrifuged at 15,000 rpm for 5 min at room temperature. The extracted

Volume 5 Issue 7, July 2016
www.ijsr.net

Dr. M. J. Keche (Botany)

International e-Conference on New Horizons And Multidisciplinary Applications In Science And Technology
In Association withInternational Journal of Scientific Research in Science and Technology
Volume 9 | Issue 6 | Print ISSN: 2395-6011 | Online ISSN: 2395-602X (www.ijsrst.com)

Protein Profile Pattern in Gamma Irradiated Wild Pea

Dr. M. J. Keche[1]

[1]Department of Botany, SGBAU, Rajarshee Shahu Science College Chandur Rly, Dist Amravati, Maharashtra, India

ABSTRACT

Genetic Variation in germplasma has important role in identification of varieties. Electrophoreticpattern of protein fraction are directly related to the genetic background of the protein and be used to certify the genetic make-up SDS-PAGE (SDS-Polyacrilamide gel electrophoresis) is valid technique increasingly being utilized as an approach for species identification, Each variety or an approach for species identification .Each variety or a group of varieties exhibit characteristic protein banding Pattern thus on the basis of the pattern they can be identified accordingly.

Keywords: SDS- PAGE, Protein, Banding pattern

I. INTRODUCTION

In recent year grain legume play important and primary role in the search for vegetable sources of protein owing to the high protein content of seed ranging from 20% in pea to 40% lupin. They can therefore , be considered a good substitution to animal protein of these legume containing amino acid and plant breeding have to consider this problem in any improvement programme (summerfield and Roberts 1985). Mutagenesis started utilizing experimental mutagen in altering seed protein in many cereals both quantitatively and qualitatively with a view to bridge protein gap cause of malnutrition (Amirsh and tavaklol 1970).

Field pea is significant pulse crop in both India and Australia. There are number of similarities that include nationally co-ordinate breaking programmer, moisture stress in rained crops low yield. Significant of powdery mildew and an intrest in developing lodging resistant varities. (Barum et.al 2000). Peas are of great nutritional importance due to their high content of protein, complex carbohydrate, dietary fiber minerals, vitamins and antioxidant compound. Although pea widely used in animals nutrition (Hedly,2001). Human consumption of pea is lower than that of other traditionally more accepted pulses (Hedly, 2001, Schneider 2002). Nevertheless in year the wealth of nutrient available from the pea and its beneficial functional properties have prompted increasing interest and demand for this legume for the food preparation oriented to generative and infant nutrition (Davidson et,al 2001).

Dr. A. D. Bansod (Chemistry)

European Journal of Chemistry

Check for updates

View Journal Policy
View Article Policy

Mononuclear pyrazine-2-carbohydrazone metal complexes: Synthesis, structural assessment, thermal, biological, and electrical conductivity studies

Ashish Bansod, Ravindra Bhaskar, Chandarshekhar Ladole, Nilesh Salunkhe, Kanchan Thakare and Anand Aswar *

Department of Chemistry, Sant Gadge Baba Amravati University, Amravati, 444602, India

* Corresponding author at: Department of Chemistry, Sant Gadge Baba Amravati University, Amravati, 444602, India.
e-mail: aswaranand@gmail.com (A. Aswar).

RESEARCH ARTICLE

10.5155/eurjchem.13.1.126-134.2186

Received: 17 September 2021
Received in revised form: 15 November 2021
Accepted: 12 February 2022
Published online: 31 March 2022
Printed: 31 March 2022

KEYWORDS

TGA
Powder XRD
Metal complexes
Biological activity
Electrical conductivity
Pyrazinecarbohydrazone

ABSTRACT

Mononuclear complexes of V(O)(IV), Cr(III), Fe(III), MoO_2(VI), WO_2(VI), and UO_2(II) with pyrazinecarbohydrazone ligand (*N'*-(1-(5-chloro-2-hydroxyphenyl)ethylidene)pyrazine-2-carbohydrazide) were synthesized and the prepared complexes were characterized by elemental analysis, magnetic susceptibility, powder X-ray analysis, various spectroscopic techniques (IR, ^{1}H NMR, ^{13}C NMR, and Mass spectra), SEM, and thermal analysis. V(O)(IV) complex was additionally characterized by ESR study. The ligand behaves as a dibasic tridentate, coordinating through the phenolate oxygen, azomethine nitrogen, and enolate oxygen atoms towards the central metal ion. The analytical data suggest 1:1 metal to ligand stoichiometry for all complexes. The physicochemical data suggested octahedral geometry to Cr(III), Fe(III), MoO_2(VI), WO_2(VI), and UO_2(VI) complexes while square pyramidal to V(O)(IV) complex. The SEM analysis indicated the presence of well-defined crystals free from any shadow of the metal ion on their external surface with particle sizes of greater than 10 µm. Various kinetics and thermodynamic parameters are calculated using Coats-Redfern method and on the basis of half decomposition temperature the thermal stability order of complexes was found to be Cr(III) < WO_2(VI) < Fe(III) < MoO_2(VI) < V(O)(IV) < UO_2(VI). The solid-state electrical conductivity of compounds was measured in their pellet form in the temperature range from 313-373 K. The conductivity data vary exponentially with the absolute temperature and obey Arrhenius equation indicating their semiconducting behavior. The antibacterial as well as antifungal activities of ligand and its metal complexes were evaluated in vitro against Gram positive bacteria (*S. aureus* and *B. subtilis*) and Gram-negative bacteria (*E. coli* and *S. typhi*) and fungal strains (*C. albicans* and *A. niger*). The activity data revealed metal complexes are found to be more active than the ligand.

Cite this: *Eur. J. Chem.* **2022**, *13*(1), 126-134 Journal website: www.eurjchem.com

1. Introduction

The Schiff bases are widely studied ligands, in their neutral or deprotonated forms, to form stable complexes with most of the transition and non-transition metal ions. Schiff base hydrazones also show numerous physiological and biological applications such as insecticides, herbicides, rodenticides, tuberculosis, nematicides, plant growth regulators, anti-bacterial, antiviral, antifungal, antidepressant, antianalgesic, anticonvulsant, antimalarial, antitumoral, anti-HIV, antipsychotic, trypanocidal, anticoagulant, polymers initiators, anti-oxidants, plasticizers and stabilizers, and enzymatic inhibitors [1-7]. Tridentate and tetradentatehydrazones are of particular interest not only for existing them in keto-enol forms and can coordinate in neutral, monoanionic, dianionic or trianionic forms but they also offer a variety of bonding possibilities in metal complexes which have even coordination number of six or seven. Furthermore, Schiff base hydrazones bearing nitrogen containing moiety have attracted considerable attention due to their impressive chemical and analytical applications as selective metal extracting agent as well as in spectroscopic determination of certain transition metals [8,9]. Electrical conductivity is an important physical property of solids not only for practical applications, but also to interpret various physical phenomena. Moreover, numerous reports suggest that pyrazoic acid hydrazone and associated compounds containing heterocyclic moiety may exhibits wide variety of biological and pharmacological properties as well [10,11]. In order to establish a relationship between the chemical structure and biological activity, divalent metal complexes of hydrazones including heterocyclic moieties involving nitrogen, oxygen and sulphur as coordinating functionalities have been studied extensively, however, complexes of higher valent metal ions are still unexplored. Recently, we have reported the biologically active hydrazone Schiff base and its divalent metal complexes and their interesting electrical and biological properties prompted us to extend further our work with higher valent metal ion complexes of pyrazine carbohydrazone of 2-hydroxy-5-chloroacetophenone to see metalation effect on such properties compared to non-substituted analog [12,13].

European Journal of Chemistry
ISSN 2153-2249 (Print) / ISSN 2153-2257 (Online)
https://doi.org/10.5155/eurjchem.13.1.126-134.2186

Dr. A. D. Bansod (Chemistry)

Bendola Publishing
Journal of Transition Metal Complexes
Vol. 5 (2022), Article ID 246138, 14 pages
doi:10.32371/jtmc/246138

Research Article

Synthesis, Characterization, Biological Activity and Solid-State Electrical Conductivity Study of Some Metal Complexes Involving Pyrazine-2-Carbohydrazone of 2-Hydroxyacetophenone

Ashish Bansod, Ravindra Bhaskar, Chandarshekhar Ladole, Nilesh Salunkhe, Kanchan Thakare, and Anand Aswar

Department of Chemistry, Sant Gadge Baba Amravati University, Amravati, Maharashtra 444602, India
Address correspondence to Anand Aswar, aswaranand@gmail.com

Received 13 November 2021; Revised 20 March 2022; Accepted 28 March 2022

Abstract A novel hydrazone Schiff base ligand N'-(1-(2-hydroxyphenyl)ethylidene)pyrazine-2-carbohydrazide (H_2L) and its Ti(III), Cr(III), Fe(III), WO_2(VI), Th(IV), and UO_2(VI) metal complexes were synthesized. The complexes were characterized by elemental analyses, magnetic susceptibility measurements, IR, reflectance spectra, thermal analysis, powder X-ray diffraction, and SEM analysis. The elemental analyses suggest 1:1 metal–ligand stoichiometry for all the complexes. The ligand coordinates as dibasic tridentate manner towards central metal ions through ONO donor sequence forming a five- and six-member chelating ring. Based on the physico-chemical studies, nonelectrolytic octahedral geometry has been suggested for all the complexes. Various kinetic and thermodynamic parameters have been evaluated from the thermal data by using Coats-Redfern equation. The solid-state electrical conductivity was measured in their pellet form over a temperature range 313–373 K and all the compounds showed semiconducting behavior as their conductivity increases with increase in temperature. The ligand and its complexes were screened in vitro for their biological activity against *E. coli* MTCC 443; *P. aeruginosa* MTCC 424; *S. aureus* MTCC 96; *B. subtilis* MTCC 8979; *E. faecalis* MTCC 439; *S. pyogenes* MTCC 442; fungal strains *C. albicans* MTCC 227, *A. niger* MTCC 282, and *A. clavatus* MTCC 1323, and all the complexes showed better biological efficacy than the free ligand.

Keywords: pyrazine-2-carbohydrazone; metal complexes; TGA; electrical conductivity; biological activity

1. Introduction

Hydrazones are characterized by the presence of the triatomic grouping $-C=N-N-$ and are found as interesting ligands in coordination chemistry due to their strong chelating ability through the electron delocalization, which is attached with extended conjugation, structure diversity and a wide range of possible applications [1, 2, 3]. Hydrazones and hydrazides have also gained considerable interest in recent years owing to their wide variety of biological and pharmacological properties as well [4, 5]. Hydrazone Schiff bases continue to attract attention of several investigators due to their diverse biological applications like antimicrobial [6], antifungal [7], anticancer [8], herbicidal [9], and so forth. The metal complexes of hydrazones including heterocyclic moieties involving nitrogen, oxygen and sulphur as coordinating functionalities have been studied extensively in order to establish a relationship between the chemical structure and biological activity [10, 11, 12, 13]. Earlier, we reported few metal complexes of biologically active hydrazone Schiff bases and compounds that showed interesting electrical and biological properties which prompted us to extend further our work with higher-valent metal ion complexes of pyrazine carbohydrazone of 2-hydroxyacetophenone to see metalation effect on such properties compared to substituted analog [14, 15]. Considering the importance associated with pyrazine-2-carbohydrazide, in the present study we describe synthesis and characterization of Ti(III), Cr(III), Fe(III), WO_2(VI), Th(IV) and UO_2(VI) complexes with the ligand N'-(1-(2-hydroxyphenyl)ethylidene)pyrazine-2-carbohydrazide (H_2L) derived from the condensation reaction of 1-(2-hydroxyphenyl)ethan-1-one with pyrazine-2-carbohydrazide (Scheme 1). After physicochemical characterization, these compounds were evaluated for their antibacterial and antifungal activities. Further, solid-state electrical conductivity of compounds has also been measured.

2. Experimental

2.1. Materials

The chemicals used were all analytical reagent grade or chemically pure grade. Pyrazine-2 carboxylic acid and 1-(2-hydroxyphenyl)ethan-1-one (99%) (Aldrich Chemical Company, USA), acetylacetone, hydrazine hydrate (98%), anhydrous titanium chloride (99%), chromium chloride hexahydrate (96%), anhydrous ferric chloride (97%), thorium nitrate pentahydrate (99%), and uranyl nitrate hexahydrate (99%) were of analytical reagent grade, obtained from SD Fine Chemicals, Mumbai, India and

Dr. S. S. Padhen (Chemistry)

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 12, Issue 4, December 2021
Impact Factor: 5.731

Studies in Solute-Solute and Solute-Solvent Interaction of Some Substituted Ketimine Drugs in 75 % Dichloromethane Water Mixture under Different Temperature by Viscometric Technique

Ganesh Andhale[1], Satyanarayan Arde[2], Sanghapal Padhen[3] and Prabhakar Kute[4]
Assistant Professor, Department of Chemistry[1,2,3,4]
Shri Shivaji Art's, Commerce & Science College, Akot, Akola, Maharashtra, India[1]
Y. C. Warana Mahavidyalaya, Warananagar, Maharashtra, India[2]
Rajarshi Shahu Science College, Chandur (Rly), Maharashtra, India[3]
Pratishthan Mahavidyalaya, Paithan, Maharashtra, India[4]
ganeshandhale005@gmail.com and kuteprabhakar@gmail.com

Abstract: *The computation of densities, specific viscosities of 5- Bromo-2-hydroxy-4-chloro (p-methyl phenyl) ketimine (L1) and 5- Bromo-2-hydroxy-4-chloro (p-amino phenol) ketimine (L2) drugs in 75% (DCM + water) mixture at the temperature range (308 to 314 K) are reported. The investigational data shows, the effect of temperature on viscosity of solute in DCM + water mixtures which gives idea about the molecular interactions present in different solutions. Considerable molecular interactions have been observed between the substituted ketimines drugs and DCM + water mixture. The experimental data at different temperature range (308 to 314 K) are used to investigate thermodynamic properties such as free energy change (ΔG), enthalpy change (ΔH) and entropy change (ΔS) of substituted ketimines drugs in 75% (DCM + water) mixture. The experimental data gives the idea about effect of temperature on the molecular interaction and structural changes in solute.*

Keywords: Ketimine, dichloromethane (DCM), molecular interaction, free energy change etc.

I. Introduction

Viscosity measurement like other properties of electrolyte, provide useful information about solute-solute and solute solvent interactions. A fluids viscosity strongly depends upon its temperature. Zarei and Jalili [1] studied measurement of viscosity at different temperature play an important role in compassionate the nature and the extent of the patterns of molecular interactions that exist in binary liquid mixtures and their sensitivities to variations in composition and the molecular structure of the pure components. Viscosity data at different temperature help in consideration of drug action through various kinds of physico-chemical interactions e.g., ionic or covalent, charge-transfer, hydrogen bonding, ionic-dipole interaction, hydrophilic interaction [2-7].

Iqbal and Siddiquah [8] studied effect of temperature on drug solvent molecular interaction plays important role to understand the proper drug action. In the field of biochemistry interaction of macromolecular drug is an important phenomenon which involve complex mechanism. The complex mechanism of drug action within the biological process and the activity of drugs at the molecular level is inappropriate to study directly as the drug solvent interactions are found to vary with temperature as well as addition of co solutes like salt, surfactants, osmolytes, proteins and carbohydrates. One of the well-recognized methods to study these molecular interactions is the use of thermodynamic method [9]. The volumetric and viscous behavior of solutes has been proven to be very useful in elucidating the various interactions occurring in solutions and it is an important key to thermodynamic properties.

DOI: 10.48175/IJARSCT-2357

B.Aadhar International Peer-Reviewed Indexed Research Journal
Impact Factor - (SJIF) –7.675, Issue NO, 287 (CCLXXXV)
ISSN : 2278-9308
April, 2021

Synthesis, Characterization, and Catalytic Activity of Some Polychelates of Salen Type Schiff Base

A.D.Bansod / A.P. Thakare
Department of Chemistry, Rajarshee Shahu Science College Chandur Rly.
Dist. Amravati 444904E-mail: ashish.bansod@rssc.edu.in

ABSTRACT

Coordination polymers of Mn(II), Fe(II), Co(II), Ni(II), Cu(II), Zn(II) and Cd(II) with the salen-type Schiff base 4, 4'-bis-[(N-ethanesalicylaldehydediamine-5)azo]biphenyl methane and have been prepared and characterized by elemental analyses, IR and electronic spectra, magnetic susceptibility measurements and thermogravimetric analysis. Thermogravimetric analysis confirms the coordination of H_2O in complexes. ^1H NMR spectrum of ligand clearly indicates presence of OH and azomethine groups. The octahedral geometry have been suggested for Mn(II), Fe(II), Co(II) and Ni(II) complexes, square planar geometry to Cu((II) whereas tetrahedral for Zn(II) and Cd(II) polychelates .Thermal data have been analyzed for kinetic parameters by both Coat-Redfern and Broido methods. Oxidation of styrene with selected catalysts was tested using H_2O_2 as an oxidant.

Keywords: Schiff base, polychelates, Thermogravimetric and catalytic activity

Introduction

Schiff bases offer a versatile and flexible series of ligands capable to bind with various metal ions to give complexes with suitable properties for theoretical and practical applications. Polymeric coordinating reagents are a novel type of ligands giving complexes having a mixture of the physical properties of a polymer and the chemical properties of the ligand. Coordination polymers derived from polymeric schiff bases have been studied extensively, however little systematic work seems to have been done on the preparation of polychelates derived from the schiff base of bisalicylaldehyde. In such symmetric bis-bifunctioning terminally metallizable schiff bases the donor atoms on the rings are widely separated, so that the ligand can coordinate with two metal atoms from the both ends giving chelate polymers. Moreover polymeric metal complexes derived from simple or polymeric coordinating ligands are generally insoluble in common solvents, have several active sites available within the molecule and are thermally stable 1. Thus, these materials may also enjoy advantageous features of heterogeneous catalysts. Catalytic activities of such materials are documented in the literature [2, 3]. The use of transition metal complexes as catalysts for epoxidation reactions has received increased attention during the last decades [4-6], particularly by the interest in understanding reactions of biological importance where the metal ion plays a central role. [7].

Considering the relevance and significance, here, we report the preparation and characterization of Mn(II), Fe(II), Co(II), Ni(II), Cu(II), Zn(II) and Cd(II) polychelates with

ISSN: 2455-2631 © July 2021 IJSDR | Volume 6 Issue 7

Synthesis, Spectroscopic, Thermal and Electrical Studies of Some Transition Metal Coordination Polymers

A.D.Bansod

Department of Chemistry,
Rajarshee Shahu Science College,
Chandur Rly. India (M.S.) 444904

***Abstract*: Coordination polymers of Mn(II),Co(II), Ni(II), Cu(II), Zn(II) and Cd(II) coordination polymers of Schiff base ligand (TDINH) derived from Terephthaladehyde and Isoniazid have been prepared. The ligand is characterized by elemental analyses, IR and electronic spectra, magnetic susceptibility measurements and thermogravimetric analysis. Thermogravimetric analysis decomposition behaviors of all the coordination polymers were studied using thermogravimetric analysis in nitrogen atmosphere. The octahedral geometry have been suggested for Mn(II), Fe(II), Co(II) and Ni(II) coordination polymers, square planar geometry to Cu(II) where as tetrahedral for Zn(II) and Cd(II) coordination polymers .Thermal data have been analyzed for kinetic parameters by both Coat-Redfern and Broido methods. The solid state electrical conductivity of ligand and its coordination polymers has been measured in the temperature range 313-413K and coordination polymers are found to show semiconducting behavior.**

***Keywords*: Schiff base, Thermogravimetric and TG/TGA, Electrical Conductivity**

I Introduction

Schiff bases containing an azomethine group (–CH=N–) are formed by condensationof a primary amine with a carbonyl compound [1]. These bases are ligands, which are active, well designed and stable under a variety of oxidative and reductive conditions [2]. Symmetric and asymmetric transition metal complexes of Schiff bases have been used as catalysts in reactions, such as epoxidation [3], asymmetric synthesis [4], asymmetric sulfoxidation [5], asymmetric silylcyanation [6], and many other applications [7].

The design of new coordination supra molecules and polymers based on the transition metal compounds and multidentate organic ligands has attracted much interest in recent years [8,9]. Coordination polymers are usually known for their thermal stability [10,11] and huge work has been reported [12-15] on the synthesis, characterization and thermal studies of coordination polymers. However, some additional equally good applications have been reported, such as solar energy converters [16] and removal of SOx and NOx from theenvironment [17]. One major goal in this area is the preparation of new compounds with interesting properties such as functional materials in molecular magnetism [18], catalysis [19]. Schiff bases and their complexes have a variety of applications in biological clinical and analytical fields [20]. Recently there has been a considerable interestin the chemistry of hydrazine and hydrazone compounds because of their potential pharmacological applications [21].

II Experimental

Material and method

All the chemicals and solvents used were of Analytical Grade (AR) and purchased commercially. All the solvents were purified by standard method and used. The compound Terephthalaldehyde and metal acetate were purchased from E. Merck Ltd. (India). Isoniazid was purchased from Himedia, India and used without further purification.

Synthesis of bis-ligand

Schiff base ligand has been synthesized by mixing ethanol solution (100 ml) of Isonicotinic acid hydrazide 0.1mol(12.4g) and ethanol(50ml) solution of Terephthalaldehyde 0.05mol(6.7g) with continuous stirring in hot condition. The resultantmixture was refluxed on a water bath for about 2 hours and left to cool, where upon crystallineyellow product which had formed was filtered off and washed several times with hot Ethanol to remove unreacted reactant. Product was recrystallized from DMF and dried under reduced pressure over anhydrous $CaCl_2$.The reaction of ligand formation has been shown in following Fig.[1]

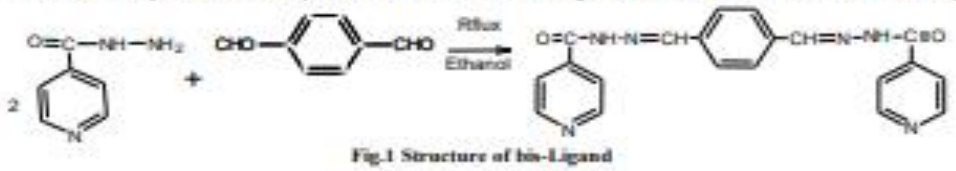


Fig.1 Structure of bis-Ligand

Synthesis of Transition Metal Coordination Polymers

Coordination polymers of Terephaaladehyde di-isonicotinoylhydrazone (TDINH) (H_2L) with Mn (II),Co(II),Ni(II),Cu(II), Zn(II) and Cd(II) have been synthesized by dissolving metalacetate in minimum quantity of DMF and were added to a solution of Terephthalaldehydedi-isonicotinoylhydrazone in DMF in 1:1 molar ratio. The reaction mixtures were refluxed inan oil bath at

INTERNATIONAL JOURNAL OF SCIENCE & ENGINEERING DEVELOPMENT RESEARCH

An International Open Access Journal ISSN: 2455-2631

Certificate of Publication

The Board of

International Journal of Science & Engineering Development Research

Is hereby awarding this certificate to

A.D.Bansod

In recognition of the publication of the paper entitled

Synthesis, Spectroscopic, Thermal and Electrical Studies of Some Transition Metal Coordination Polymers

Published in Volume 6 Issue 7, July-2021

ISSN 2455-2631

Co-Authors -

Paper ID - IJSDR2107036

Editor-In Chief

www.ijsdr.org | editor@ijsdr.org

International Journal for Multidisciplinary Research
International Conference on Multidisciplinary Research & Studies 2023
E-ISSN: 2582-2160 ● Website: www.ijfmr.com ● Email: editor@ijfmr.com

Synthesis, Characterization and Biological Activity of Cr (III), Mn(III) And Fe(III) Complexes of Schiff Bases Ligands

A.D.Bansod

Department of Chemistry, Rajarshee Shahu Science College, Chandur Rly444904 (M.S.) India

Abstract

Metal complexes of Cr(III),Mn(III) and Fe(III) with symmetrical Schiff bases (derived from the *p*-phenylenediamine with2-4dihydroxyacetophenone or 2-5 dihydroxyacetophenone) have been prepared and charchterirized by physical–chemical methods. On the basis of electronic spectra and magnetic susceptibility measurement inconjugation with infrared spectra six coordinated octahedral structure have been proposed to Cr(III) and Fe(III) complexes,while Mn(III) complex may have a square pyramidal structure.Thermal stability of the complexes have been tested for their antibacterial activity against the bacteria *Ecoli,Bacillus sp,stappylococus* and *Pseudomonussp*.The solid state conductivity of ligand and complexes were also measured in their compressed pettet from in the temperature range 310-450 K and all complexes were are found to be semiconducting in behaviour.

Key words: Schiff bases, Complexes, Biologicalactivity

Introduction

The transitions metal complexes with bidentate and tetradentate ligand containing both hard and soft donor groups,have been extensively in coordination and orgnometallic chemistry[1] Schiff bases containing polyfuctional groups not only produced stable metal complexes of transition, non–transition, inner–transition and actinide metal ion, but these ligands and their metal complexes have also played a significance role in the domains of stereochemistry, structure isomerism, magnetism,spectroscopy,kinetics and mechanisms of reactions,reaction of coordinated ligands,model system of biochemical interest, analytical chemistry,catalysis stabilizers, polymers,pigments and dyes. electro-optical display devices and agriculture[2-4] In view of the growing interest in the biological and electrical properties of Schiff base complexes in this communications,synthesis ,characterization,biological and electrical properties of Cr(III),Mn(III) and Fe(III) complexes containing dibasic tetradentate Schiff bases derived by condensing substituted acetophenones with *p*- phenylenediamine, has been reported .

Experimental and Methods

All of the reagents used were of analytical or chemical pure grade. Solvents were purified and dried according to standard procedures. The substituted acetophenones were prepared by Fridal-Craft reaction $Mn(OAc)\ 2H_2O$ was prepared by the reported method [5].

Preparation of H_3L^1 and H_3L^2

A hot ethanolic solution (10mL) of *p*-phenynedimine (0.01mol) was added to a hot solution of 2-4 dihydroxyacetophenone or 2-5 dihydroxyacetophenone (0.02mol) in60mL ethanol and the reaction mixture was refluxed for 2-3 h on a water bath.After reducing the solvents to *Ca* 20mL, It was kept overnight, the

B.Aadhar International Peer-Reviewed Indexed Research Journal
Impact Factor - (SJIF) –7.675, Issue NO, 287 (CCLXXXV)
ISSN : 2278-9308
April, 2021

"Synthesis and Thermal analysis study of Cr(III) & Fe(III) complexes derived from Chalcone ligand"

Amol P Thakare1 & Ashish D Bansod2

1, 2 Department of Chemistry, Rajarshee Shahu Science College, Chandur Rly
E-mail: amol.thakare@rssc.edu.in

Abstract: The research includes the synthesis of new chalcone ligand by the condensation of aromatic aldehyde with ketone. From this ligand new Cr(III) and Fe(III) complexes were synthesized and characterized. The thermal behavior of metal complexes was studied in the temperature range of 0 to 8000 C. The thermogravimetric analysis studies of the complexes reveal that the decomposition proceed in three steps. The data obtained indicates that Fe(III) complex was more thermally stable compared to Cr(III) complex. Freemann- Caroll method was applied to find out different kinetic parameter i.e. activation energy, order of reaction, entropy change, free energy change.

Keywords: Chalcone, Complex, TGA, Freemann-caroll, kinetic parameter.

1. Introduction

Coordination chemistry has been a challenge to the all chemist throughout the world ever since the first synthesis of coordination compound was observed in the nineteenth century. Coordination chemistry mainly concerned with the interaction of organic or inorganic ligands with metal centers. Chalcones are compounds which are synthesized by condensing aromatic aldehyde with ketone. Chalcones are the immediate precursors in the biosynthesis of flavonoids, and their structure differs considerably from the others members of the flavonoid family, since chalcones are open-chain analogs in contrast to the other family's members. This chalcone act as versatile ligand to form a metal complex with transition metal ion . Synthesis and characterization of such unsaturated carbonyl systems and their metal complexes have tremendous importance. Thermogravimetric analysis or thermal gravimetric analysis is a method of thermal analysis in which changes in physical and chemical properties of material are measured as a function of increasing temperature or as a function of time. TGA is commonly used to determine selected characteristics of material that exhibit either mass loss or mass gain due to decomposition, oxidation or loss of moisture (water molecule). Present study consist of synthesis of chalcone by condensing aromatic aldehyde with ketone. From that chalcone new Cr(III) and Fe(III) metal complexes were synthesized and characterized with the help of various spectroscopic techniques. [1-5].

2. Experimental

All chemicals used were of the analytical reagent (AR) grade and of highest purity available and purchased from SD-Fine Chem Limited. They included furfuraldehyde, Cr(Cl)3.6H2O, Fe(Cl)3.6H2O, were used.

Melting points were determined with an Electro thermal 9100 apparatus and are uncorrected. IR spectra were recorded on a Shimadzu 4300 spectrometer. NMR spectra were recorded with a Brucker 80 instrument using TMS as internal standard. The presence of coordinated water or crystal water was established by TGA studies using TGA Q 5000 V3.13 build 261 instrument.