VOLUME - XII, ISSUE - I - NOVEMBER - APRIL - 2023-24
GALAXY LINK - ISSN 2319 - 8508 - IMPACT FACTOR - 7.878 (www.sjifactor.com)

११. स्पिनोझा व लायब्निझच्या द्रव्याचे स्वरुप

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तत्वज्ञान विभाग प्रमुख, महात्मा फुले महाविद्यालय, वरुड, जि. अमरावती.

विश्वातील वस्तू कोणाच्यातरी आश्रयाने अस्तित्वात असतात म्हणून त्या वस्तुंना पराधीन, परावलंबी वा पराश्रित मानावे लागते. आणि अशा वस्तूंना स्वतंत्र व स्वावलंबी मानल्यास त्यांना परावलंबी, पराश्रित मानता येत नाही. ज्याच्या आधारावर विश्वातील सर्व वस्तू अवलंबून राहून अस्तित्वात येतात वा आहेत. अशा प्रकारच्या द्रव्याला मानून त्याची व्याख्या देण्याचा प्रयत्न झालेला आहे रेने देकार्त या फ्रेंच तत्वज्ञाने द्रव्याची व्याख्या देतांना असे म्हटले की, द्रव्य म्हणजे अशी अस्तित्ववान गोष्ट की जी अस्तित्वात येण्यासाठी दुसऱ्या कशाचीही अपेक्षा करीत नाही. ईश्वरी द्रव्यालाच हि व्याख्या लागू पडणारी आहे, असे देकार्तच्या तत्वज्ञानात दिसून येते. व्याख्येच्या दृष्टीने ईश्वरालाच द्रव्य म्हणून संबोधावे लागते. परंतु देकार्तच्या तत्वज्ञानात असे दिसून येते की, चेतन व जड द्रव्य यांना देकार्तने द्रव्य म्हणून संबोधले आहे. अशी एक प्रकारची धरसोडीची प्रवृत्ती देकार्तच्या विचारांमध्ये दिसून येते.

बेनेडिक्ट स्पिनोझाने सुध्दा द्रव्याचे अस्तित्व व स्वरूप स्पष्ट केले. स्पिनोझाच्या मते, द्रव्य म्हणजे अशी वस्तू की जी स्वतः आत्मस्थित असते आणि स्वतःच्या व्दारेच जाणली जाते. याचा अर्थ ज्याला आपण द्रव्य म्हणून समजतो. ते स्वतःमध्ये पुर्ण असते. स्वतंत्र असते. आणि त्याच्या अस्तित्वाला किंवा ज्ञानाला स्वतः शिवाय दुसऱ्याची गरज नसते.

स्पिनोझाने अशा द्रव्याची वैशिष्टये सुध्दा सांगितलेली आहेत.

1. **द्रव्य स्वतंत्र असते** :– जी गोष्ट स्वतःहून वेगळया वस्तुवर अवलंबून नसते तिला आपण स्वतंत्र म्हणतो. स्पिनोझाचे द्रव्य स्वतंत्र आणि स्वाधीन असे आहे. परंतु बाहय जगाचे मुलद्रव्य किंवा तुमचा आमचा आत्मा द्रव्यावर अवलंबून आहे. यावरून स्पिनोझाचे द्रव्य स्वतः त्याचप्रमाणे त्यामध्ये समाविष्ट होणाऱ्या सर्व गोष्टीचे मुळ आहे.
2. **द्रव्य निरपेक्ष असते** :– स्वतःच्या अस्तित्वासाठी ज्याला दुसऱ्याची गरज नसते ते निरपेक्ष तत्व होय आणि ज्याला दुसऱ्याची गरज वा अपेक्षा असते ते सापेक्ष तत्व होय. या दृष्टीने विचार केल्यास स्पिनोझाने मानलेल्या द्रव्याला दुसऱ्या कशाचीही गरज वा अपेक्षा नाही, म्हणून स्पिनोझाचे द्रव्य निरपेक्ष असे आहे.
3. **द्रव्य अव्दितीय असते** :– जे जे स्वतंत्र आणि निरपेक्ष असते ते ते एकमेव असते. संख्येने एकच एक असते. आणि जर आपण हे मान्य केले नाही तर व्याघाताचा दोष निर्माण होतो. कारण एकापेक्षा जास्त द्रव्य स्वतंत्र व निरपेक्ष म्हणून मान्य केल्यास ते द्रव्य एकमेकांना मर्यादा घालतील आणि ते स्वतंत्र व निरपेक्ष न राहता परतंत्र व सापेक्ष ठरतील. परंतु स्पिनोझाने मानलेले द्रव्य निरपेक्ष आहे व संख्येने एक आहे आणि अव्दितीय ठरलेले आहे.
4. **द्रव्य स्वतःच स्वतःचे कारण असते** :– एखाद्या व्यक्तीने एखादी वस्तू निर्माण केली तर ती त्याच्यापासून वेगळी होते. म्हणजेच कार्य हे कारणापासून वेगळे असते. परंतु द्रव्य आणि त्याच्यापासून निर्माण झालेल्या कार्याबाबत अशाप्रकारचा वेगळेपणाचा संबंध निर्माण होत नाही. द्रव्याचे कार्य त्याच्या

Information Seeking Behavior of Users in Libraries: An Overview

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Abstract:-

Information Seeking Behavior models are generally statements, often in the form of diagrams that attempt to explicate an information-seeking activity, the causes and consequences of that activity, or the relations among stages in information Seeking Behavior (Wilson, 1999). Information-seeking models aim to describe the process that the user follows to satisfy his information needs and, while fulfilling that need, he approaches towards formal and informal information sources or available services. A number of models have been designed by various authors and researchers from time to time globally relevant to information needs and seeking behavior of users in various academic institutions. In this paper an overview of theoretical and some of the models of information seeking behavior are provided.

Key Wards: - Information seeking, Information need, Information.

Introduction:-

The word "information" was apparently derived from the Latin stem of the nominative information; this noun is, in its turn, derived from the verb "informare". When the raw data is processed or value is added to it, data becomes information. A model may be defined as a structure for thinking about a perceived problem and may evolve into a statement of the relationships among theoretical propositions. Information-seeking models diagrammatically represent the complex tasks of the information-seeking process.

Education is a basic need for the development of society. National, human and economic growth is achieved due to education and hence, in any field of knowledge, education plays an important role. Education in any faculty brings out improved values to every citizen and helps in building a better future. Education helps in making people aware of the activities and developments carried around the world. The main purpose of education is to build confidence in the minds of people and develop courage to face the changes in the different systems to sustain various competitions in life.

International Journal of Science and Research Archive
eISSN: 2582-8185
Cross Ref DOI: 10.30574/ijsra
Journal homepage: https://ijsra.net/

(REVIEW ARTICLE)

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Role of Relativistic Charged Perfect Fluid in Bianchi type-III Space-time in Brans-Dicke theory of gravitation

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International Journal of Science and Research Archive, 2024, 11(02), 035–044

Publication history: Received on 13 January 2024; revised on 24 February 2024; accepted on 27 February 2024

Article DOI: https://doi.org/10.30574/ijsra.2024.11.2.0355

Abstract

In this paper, we investigate the role of relativistic charged perfect fluid in Bianchi type-III cosmological model in Brans-Dicke theory of gravitation. Solutions of the model are obtained by volumetric exponential expansion, power law expansion and power law relation between scalar field ϕ and the scale factor a. Some physical and kinematical properties of the model also are studied.

Keywords: Bianchi type-III universe; Brans-Dicke theory of gravitation; Electromagnetic field; Perfect fluid; Constant vector potentials

1. Introduction

Brans - Dicke theory of gravitation is a well-known modified version of Einstein's theory. Brans and Dicke [1] formulated a theory of gravitation in which, besides a gravitational part, a dynamical scalar field is introduced to account for variable gravitational constant and to incorporate Mach's Principle in Einstein's theory. In this theory, the scalar field has the dimension of the universe of a gravitational constant and its role is confined to its effect on gravitational field equations. Brans-Dicke scalar-tensor theory of gravitation is quite important in view of the fact that scalar fields play a vital role in inflationary cosmology. There has been a renewed interest in gravitational constants in recent years. "The new inflationary models [2], the potential problem of "graceful exit" [3] and extended chaotic inflation [4] are based on the gravity theory of Brans-Dicke.

The scalar-tensor theories have been the subject of considerable interest in the study of various cosmological models due to their relevance for the inflationary expansion of the universe and to solve many outstanding problems in cosmology. Several aspects of Brans-Dicke theory have been widely examined by many authors. Bardeen et al. [5] explored the inflationary universe models which provide a mechanism for galaxy formation by generating small scale density fluctuation in the universe, Bianchi type-I string cosmological models with and without a source-free magnetic field have been examined by Banerjee et al.[6]. Johari and Desikan [7] have investigated cosmological models with constant deceleration parameter in Nordtvedt's theory. In Brans-Dicke theory of gravity, Bianchi type-III cosmological model with a negative constant deceleration parameter in presence of perfect fluid have been studied by Adhav et al.[8], Katore et al. [9] explored a plane symmetric space-time filled with dark energy models in Brans-Dicke theory, Bhoyar et al.[10] studied Bianchi type-III and Kantowski Sachs cosmological model containing a magnetic field with variable cosmological constant. Lorenz-Petzold [11], Kumar et al.[12], Pawar et al. [13], Rao et al.[14], Naidu et al.[15], Kandalkar et al. [16],Mete et al. [17],Sireesha et al. [18],Hegazy et al.[19],Trivedi et al.[20] are some of the authors who have

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wjpls, 2023, Vol 9, Issue 9, 61-64 Review Article ISSN 2454-2229

World Journal of Pharmaceutical and Life Sciences
WJPLS
www.wjpls.org
SJIF Impact Factor: 6.129

SOME WETLAND PLANTS OF WARUD TAHSIL, DISTRICT AMRAVATI. (M.S.), INDIA. A REVIEW

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Article Received on 08/07/2023 **Article Revised on 28/07/2023** **Article Accepted on 18/08/2023**

ABSTRACT

Wetlands places are most common along rivers, streams, edges of lakes, ponds on floodplains. These places varied due to regional and local differences in soils and climate. Wetland habitat may support aquatic as well as terrestrial species. The present paper study with an account on floristic composition of wetland plants of Warud tahsil, district Amravati, (M.S.), India. The field survey was conducted around the river, lakes and where water covers the soil, to collect information of wetland plants. The dicotyledonous vegetation is common because of number of species and genera. Data on the use of plants was collected from the peer-reviewed literature and semi structured questionnaire. The documentation of traditional uses of wetland plants will be helpful in conservation of biodiversity and can be used in treatment of different ailments. On the basis of investigation, about 20 plants species belonging to 18 families are collected and describe it scientific name, local name, part used, family, and medicinal use for number of ailments.

KEYWORD: Wetland, Floristic composition, Warud tahsil, Habitat, Angiosperm.

INTRODUCTION

Wetlands places are the region of transition between terrestrial and aquatic ecosystems and is often termed as kidney of the landscape (Mitsch and Gosselink 2000). In recent years, many plant species are gradually decreasing in their earlier places of occurrence due to changing in habitat, over harvesting and invasion of exotic species and weeds (Lacoul and Freedman, 2006). In India wetland habitats are identified as the richest biomes that maintain near about 800 plant species consumed as food though it covers only 5% of the total geographical area. Rural and tribal people inhabiting in the area have traditional knowledge of wetland plants. The main aim of the present research work is to collect and document the local knowledge about the plant resources used by the folk people of Warud tahsil district Amravati (M.S.), India that may help in loss of native wetland biodiversity.

MATERIAL AND METHOD

Study site:

Warud tahsil is located at north-east side of Amravati district in the state of Maharashtra. Morshi tahsil is located towards Westside, Madhya Pradesh state towards north, Nagpur district towards east and Wardha district towards south of the tahsil. Study region lies between 210 21' 33" to 210 38' 54" North latitudes and 780 1' 54" to 780 25' 7" East longitudes. Tahsil covered total 745 sq.km area. The Northern border tahsil is the mountainous ranges of satpudas. Near about 15% population of Warud tahsil is tribal and out of them more than 85% tribal population situated in rural region. Rural and tribal people inhabiting in tahsil have good knowledge of herbal medicine. Many people use to treat their ailments by using fresh plant material. There are many rivers, lakes and damps in Warud area. The present paper data is collected by the survey method around the occurrence of a considerable number of species in stagnant water and wet places. The presence of huge water bodies favours the occurrence of a rich hydrophytic flora in the river system.

Data collection

The present field study was conducted during the year 2021 to June 2023 around river, ponds, lakes and stagnant water and wet places. Collect plant species were identified on the basis of standard floras, monographs, including Cooke, T.H. (1998), Flora of the Presidency of Bombay, N.R.Ugemuge (1986), Flora of Nagpur district, Naik, V.N. (1998), Flora of Marathwada, M. A. Dhore (2002),Flora of Amravati District, Mitsch WJ, Gosselink JG, (1993) Shubham Mittal and Ujwal nautiyal (2019),

International Journal of Science and Research (IJSR)
ISSN: 2319-7064
SJIF (2022): 7.942

Thermal Degradation Studies and Kinetic Parameter of Biphenol and Butanediamine

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Abstract: ***The present paper informs the thermal degradation studies of 2, 2' - biphenol - butanediamine - formaldehyde terpolymer. Initially this terpolymer was synthesized from 2, 2' - biphenol, butanediamine with formaldehyde by the polycondensation reaction in the presence of acid catalyst at temperature 150 ^{0}C. The terpolymer after purification were characterized by elemental analysis and spectral studies such as UV - Visible, FT - IR and ^{1}H - NMR spectra which were used to confine the most probable structure of synthesized terpolymer. Characterization was carried out by different physicochemical techniques viz. Number average molecular weight determines by Non - aqueous conductometric titration and Intrinsic viscosity by Ubbelohde Viscometer. Non isothermal thermogravimetric technique has been carried out for thermogravimetric study. Freeman - Carroll methods have been applied for the calculation of kinetic parameters. Thermal study of the terpolymer was carried out to determine their mode of decomposition and relative thermal stability by calculating activation energy, order of reaction and frequency factor. By studying above method we concluded that this newly prepared terpolymer is thermally stable at high temperature.***

Keywords: Polycondensation reaction, physicochemical studies, spectral studies, thermal behaviour and stability

1. Introduction

The development of new and improved polymers and their application in novel areas have led to innumerable new products. Since the modern history of thermogravimetry, thermal degradation of polymers and study of its kinetics has been at the centre of thermal analysis [1, 2].

Materials that are used in everyday life have an immense impact on the development of the human society. During the Stone Age and Iron Age epochs, humans widely used stone or iron to make tools. In the present age, there is no question that polymers and plastics dominate our rapidly developing daily needs and show enormous potential for the development of new technologies. Constructive materials, such as polyolefins, polyesters or polyamides are preferentially made of standard polymeric materials. It is therefore obvious that the future of polymer chemistry will be influenced by the elaboration of new functional polymers. Nowadays, the development of various functional polymers is becoming increasingly important in specific areas of application.

2. Literature Survey

Gurnule and Bisen studied thermal decomposition of copolymer resin - II and its kinetics derived from 4 - hydroxylbenzaldehyde, phenyl hydrazine and formaldehyde [3]. Physico - chemical and thermal degradation studies of 2, 2' - biphenol - ethylenediamine - formaldehyde resin has been done by Bobde et al [4]. Thermal stability of polyureas derived from 4 - aryl - 2, 6 - bis - (4 - amino - phenyl) pyridines and diisocynates have been studied by Tamami et al [5]. Terpolymers were synthesized by condensing 2, 4 - dinitrophenyl hydrazone of 4 - hydroxyacetophenone with substituted benzoic acids/phenols and formaldehyde in presence of NaOH or HCl as catalyst by Rath et al [6]. Dharkar and other researchers [7] synthesized the melamine - aniline - formaldehyde terpolymeric ligand and carried out its thermal degradation study.

3. Exprimental

2, 2' - BPBDAF terpolymer was synthesized by condensation of 2, 2' - biphenol (1.86 gm, 0.1 mol) and butanediamine (2.01 gm, 0.2 mol) using the linkage of formaldehyde (15 ml, 0.4 mol) with the molar ratios of 1: 2: 4 in presence of 2M hydrochloric acid (200 ml) as a catalyst. The mixture was heated at 150 ^{0}C in an oil bath for ten hours with frequent shaking [8 - 10]. The temperature of electrically heated oil bath was controlled with the help of dimmerstat. The solid pale pink colored product obtained was immediately removed from the flask as soon as the reaction period was over. The yield of this terpolymer was found to be 82 %. Scheme 1 represents proposed reaction for the formation of 2, 2' - BPBDAF terpolymer as follows. Figure 1 represents proposed reaction and synthetic details are reported in Table 1 for the formation of 2, 2' - BPBDAF terpolymer as follows.

Table 1: Synthesis details of 2, 2' - BPBDAF terpolymer

Terpolymer	Reactants			Molar ratios	Catalyst 2M HCl (ml)	Reflux Temp. ^{0}C	Yield (%)	Time (hrs)
	2, 2' - Biphenol (2, 2' - BP) (mol)	Butanediamine (BDA) (mol)	Formaldehyde (F) (mol)					
2, 2' - BPBDAF	0.1	0.2	0.4	1: 2: 4	200	150	82.00	10

International Journal of Science and Research (IJSR)
ISSN: 2319-7064
SJIF (2022): 7.942

Synthesis and Non-Isothermal Degradation Studies of Biphenol and Hexamethylenediamine

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Abstract: ***Polycondensation reaction was employed to synthesize the new 2,2'-BPHMDAF terpolymer from the monomers namely 2,2'-Biphenol (2,2'-BP), Hexamethylenediamine (HMDA) with Formaldehyde (F) in presence of 2M HCl as a catalyst using 1:1:2 molar ratios at temperature 150 ^{0}C. The terpolymer after purification was characterized by elemental analysis and spectral studies such as UV-Visible, FT-IR and ^{1}H-NMR spectra which were used to elucidate and confirmed the most probable structure of synthesized terpolymer. The synthesized terpolymer was then further characterized by different physicochemical techniques viz. Number average molecular weight determines by Non-aqueous Conductometric titration and Intrinsic viscosity by Ubbelohde Viscometer. The thermogravimetric study of the prepared terpolymer has been carried out by non isothermal thermogravimetry technique in which sample is subjected to condition of continuous increase in temperature at linear rate. Thermal study of the terpolymer was carried out to determine their mode of decomposition and relative thermal stability by calculating activation energy, order of reaction and frequency factor. Freeman-Carroll method's activation energy was further used to determine the thermodynamic parameters such as entropy change, free energy change and apparent entropy change. 2,2'-BPHMDAF terpolymer was synthesized to determine its thermal stability and which were proved to be thermally stable by studying above methods.***

Keywords: Condensation polymerization, spectral studies, physicochemical techniques, thermogravimetric analysis, Study of kinetic parameters

1. Introduction

Polymers have become an essential and ubiquitous part of our lives. Polymer uses are being developed in such diverse areas like conduction and storage of electricity, heat and light, molecular based information, storage and processing, molecular composites, unique separation membranes, revolutionary new forms of food processing and packaging, health, housing, transportation, etc. Manufacturers have also used the polymers in creation of a variety of products from adhesives and lubricants to implantable devices like orthopedic plates, artificial joints and heart valves, non plastic objects like silicone and paper, and became a large part of our everyday life and can be found in hundreds of different products.

The decomposition pattern and kinetics of polymer degradation can be studied by thermogravimetric analysis and which can be carried out in inert as well as oxidative atmosphere [1]. A wide variety of thermally stable polymers have been synthesized and the sequence of their thermal stabilities has been predicted from their TG data. Kinetic analysis may effectively assist in studying degradation mechanism as well as in predicting the thermal stability of polymers [2]. Phenolic resins are known for their wide applications in various areas because of their thermal stability, easy availability, cost effectiveness and some of their excellent properties [3].

2. Literature Survey

Thermal degradation studies of p-nitrophenol based copolymer was done by Kalbende et al [4] and Friedman, Chang, Sharp-Wentworth, Freeman-Carroll and Coat-Redfern methods have been implemented in order to compute the kinetic parameters. Urade et al [5] carried out structural and thermokinetic parameters of terpolymeric resin derived from p-hydroxyacetophenone, bis (2-amino- 1, 3, 4 - thiadiazole) and glycerol.

Thermoanalytical studies and kinetics of newly synthesized copolymer derived from p-hydroxybenzoic acid and semicarbazide with formaldehyde were carried out by Nandekar, Dontulwar and Gurnule [6]. Thermogravimetric and spectroscopic analysis of 8-hydroxyquinoline 5-sulphonic acid-melamine-formaldehyde polymer resin-IV was studied by Singru [7]. Butoliya et al [8] studied the non-isothermal decomposition and kinetic analysis of 2,4-dihydroxybenzoic acid-melamine-formaldehyde copolymer. Non-isothermal kinetic study of *p*-cresol-dithiooxamide-formaldehyde terpolymer was done by Gurnule and Katkamwar [9]. Tarase et al carried out kinetics of thermal degradation studies of terpolymers derived from 2,4-dihydroxypropiophenone, oxamide and formaldehyde [10]. Acid catalyzed terpolymer resin 2,2'- biphenol-ethylenediamine-formaldehyde has been synthesized by Bobde et al and studied its physico-chemical and thermal degradation behaviour [11].

The development of new and improved polymers and their application in novel areas have led to infinite new products. Polymers differ in characteristics because of their unique structural complexities. Therefore, in this article, we have attempted to investigate the thermostability and several important kinetic parameters of terpolymer obtained by acid catalyzed polycondensation reaction of 2,2'-biphenol, hexamethylenediamine and formaldehyde to study the novelty of new thermally stable terpolymer.

3. Experimental

Materials and methods

International Journal of Science and Research (IJSR)
ISSN: 2319-7064
SJIF (2022): 7.942

Study of Some Physicochemical Parameters of Drinking Water Sources in Shendurjana Ghat Region Dist. Amravati, MS, India

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Abstract: ***Physicochemical analysis of water samples KMK-I, KMK-II and KMK-III have been collected from Shendurjana Ghat Dist. Amravati (MS, India) region. Insectisides, pesticides and various fertilizers were used for getting higher yield of crops, vegetables, fruits which is continuously create soil, air and water pollution, all these things in to consideration to carry out physicochemical analysis. Physicochemical analysis of water samples it was found that, generally all parameters studied do not show undesirable effect on the human being except in few parameters.***

Keywords: Physicochemical parameter, drinking water sources.

1. Introduction

The availability of water both in terms of quality and quantity is essential for the very existence of mankind. There is heavy extraction of water for domestic, industrial and agricultural purposes leads to more than 50 per cent of water wastage in the domestic, agriculture and industrial sectors. Water pollution is rendering much of the available water unsafe for consumption. In India, Most of the populations are depend on surface water as the source of drinking water supply. Water is the most important in shaping the land and regulating the climate. It is one of the most important compounds that profoundly influence life [1]. Poor water quality has a direct impact on water quantity which is available for drinking in a number of ways. Polluted water that cannot be used for drinking, bathing and industry or agriculture purpose effectively reduces the amount of usable water within a given area. Not with standing, the use of low quality water (for example saline or brackish water) may have important and direct impacts on productive water such as irrigated agriculture, with important effects on land degradation, crop production and consequently on rural income and food security. Around 700 million people in 43 countries suffer today from water scarcity, a situation there are not sufficient water resources to satisfy long-term average requirements of mankind (Falkenmark, et al., 2001). According to WHO organization, about 80% of all the diseases in human beings are caused by water [2].

Water is essential to sustain life, and a satisfactory (adequate, safe and accessible) supply must be available to all (WHO, 2008). Adequate safe water supply is an indispensable ingredient in promoting economic development and betterment of human welfare in every nation. Water is the basic resource essential for the survival of mankind on earth and it is the greatest gift of nature. Man's activities on the environment often results in pollution and degradation of water bodies. Water bodies must therefore be jealously guided and protected from being polluted, which will affect water quality and availability for desired usage. Causes of water quality impairment are urban and rural storm water runoff, inadequate waste water treatment, nutrient entrophication, atmospheric deposition and acid rain, pollutant in sediments and fish, and nuisance aquatic weed growth and invasive species.

As we all know water is the most important requirement for human life to survive. Depending upon the intended use of water certain quality parameters are established and based on this criteria quality standard is specified. Physical parameters play an important role for quality of water and waste water. The quality of water depends on the location of sources and environmental protection in given area. Water is a natural resource that is fundamental to maintaining life. Water ecosystems have undergone profound changes in recent years, mainly due to human activities, at a range of levels. These ecosystems receive a large variety and quantity of pollutants, either through the soil or by being directly discharged into water, with subsequent impact both on the environment and on human health [3].

Minerals are good for human health but in appropriate quantity. If minerals are consumed in high or low intake, it may impose life threatening risk to human health [4]. Among all the minerals, fluoride is one of the important in ground water that prevents the tooth decay and controls the metabolic bone diseases [5]. Various types of water related activities can cause beneficial or adverse impacts on the environment, water channelization, flood, land alteration and changes in land use patterns. In recent year's continuous growth in pollution, rapid industrialization and accompanying technologies involving waste disposal has endangered the very existence of human

Paper ID: SR23710155348
DOI: 10.21275/SR23710155348

International Journal of Scientific Research in Biological Sciences
Vol.10, Issue.3, pp.70-74, June 2023
E-ISSN: 2347-7520
Available online at: www.isroset.org

Research Paper

Study of Diversity of Scolopendrid Centipedes (Chilopoda: Scolopendromorpha) in Achalpur Region, District Amravati, Maharashtra, India

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Received: 25/Mar/2023; **Accepted**: 02/May/2023; **Published**: 30/Jun/2023

Abstract— The present paper deals with the diversity of Scolopendrid Centipedes fauna in Achalpur region, District Amravati, Maharashtra State of India. This study was done during July 2021 to October 2021 for total four months by visiting different habitats of Achalpur region. Samples were collected by using different collection methods such as hand collection method by using forceps and species were identified with the help of standard taxonomic literature. Total 04 species of Centipedes belongings to 02 genera namely *Scolopendra* and *Cormocephalus* under family Scolopendridae were identified from the study area.

Keywords— Centipedes, Diversity, Scolopendridae, Chilopoda, Species.

1. Introduction

Centipedes are multi-segmented, nocturnal, poisonous, predatory and economically important soil arthropods belonging to Class Chilopoda of Phylum Arthropoda, under Subphylum Myriapoda which also includes millipedes and other multi-legged arthropods. About 8,000 species of centipedes are distributed globally, of which approximately 3,000 have been described (Adis and Harvey, 2000) [1]. Centipedes are soil insects occupying diverse habitats but commonly prefer wet and moist places and are often found in bark of trees, under stones, in leaf litter, dead woods or other damp areas.

Body of centipedes is elongated, worm-like, frequently flattened and multi-segmented having one pair of legs for each body segment. The word "Centipede" derives from the Latin root which means "hundred legs". It is not necessary that centipede has exactly 100 legs; centipedes are different in presence of number of legs, ranging from 30 to 382 (Shelley, 1999) [2] and they always have an odd number of pairs of legs (Arthur, 2002) [3]. They show variation in body colour and size. The colour vary from brown to grey to red to greenish-blue, the smallest centipede (*Nannarrup hoffmani*) grows up to 10 mm in length (Stewart, 2002) [4], while the longest (*Scolopendra gigantea*) may reach over 12 inches (30 cm) long, know to eat frogs, lizards, birds and small mammals (Molinari *et. al*, 2005) [5].

Centipedes are basic and major component of terrestrial ecosystems throughout the temperate and tropical regions. They are primarily carnivorous (Lewis, 2007) [6]. They also benefit soil microorganisms, that work together to turn any debris into nutrient-enriched soil. Mostly all the centipedes are active predators in the soil ecosystem, and generally feeding on small invertebrates, sometimes even larger than them thus, plays a major role in terrestrial food chains, regulate herbivores and act as a decomposers, litter transformers, micro regulators and ecosystem engineers (Moreira *et al.*, 2012) [7]. Few species of centipedes are able to prey on some small aquatic invertebrates, hence considered to be amphibious (Sho, 2021) [8]. Centipedes also feeds on many insects and helps to controls pests population in terrestrial ecosystem (Yadav, 1994) [9].

Taxonomically Class Chilopoda divided in to five orders namely Scolopendromorpha, Lithobiomorpha, Scutigeromorpha, Geophilomorpha and Craterostigmomorpha (which is not found in India), of which Order Scolopendromoprha is comparatively well described from India than other orders. The centipedes belong to this order possess 21 to 23 pair of legs and the same number of body segments. Order Scolopendromoprha divided into five

RP Current Trends In Applied Sciences
Vol. 2, No. 4 (October – December 2023) pp. 78–83
e-ISSN: 2583-7486

RESEARCH PLATEAU PUBLISHERS

Cite this article: S. Khangar, O.P. Chimankar, Y.S. Tamgadge, R.Y. Bakale, Ultrasonic and spectroscopic investigation of aqueous polyvinyl alcohol (PVA) solutions, *RP Cur. Tr. Appl. Sci.* **2** (2023) 78–83.

Original Research Article

Ultrasonic and spectroscopic investigation of aqueous polyvinyl alcohol (PVA) solutions

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ARTICLE HISTORY
Received: 30 June 2023
Revised: 10 Nov. 2023
Accepted: 11 Nov. 2023
Published online: 18 Nov. 2023

KEYWORDS
Ultrasonic velocity; Density; Viscosity; FTIR; UV.

ABSTRACT
Using distilled water as solvent, different weight percentages of polyvinyl alcohol solutions were prepared and were then examined using the FTIR, UV-visible, and ultrasonic pulse echo techniques. In physics, ultrasound is a vital and efficient research tool. Understanding the physicochemical behavior of liquids and determining the nature of molecular interactions have become increasingly important goals of the ultrasonic study of liquid mixtures. Additionally, it offers a powerful and trustworthy instrument for examining ultrasonic properties of polymer solution in the context of phase separation research. Ultrasonic velocity (u), Density (ρ) and viscosity (η) for aqueous polyvinyl alcohol have been measured at 2 MHz and at temperature range 288K-308K and at concentration range 0.05wt% to 0.3 wt% by pulse echo technique. From this data, acoustic parameters such as adiabatic compressibility (β_a), acoustic impedance (Z), relaxation time (τ) and free length (L_f) were calculated for aqueous PVA solutions. The results are interpreted as per the molecular interactions in the aqueous PVA solutions and compared with the results obtained from FTIR and UV- visible spectroscopy. PVA can be employed as a tablet binder in the pharmaceutical industry due to the interactions observed in the solutions. The strength of molecular interactions in aqueous PVA solutions is indicated by thermo acoustic parameters including ultrasonic velocity, density, viscosity, adiabatic compressibility, acoustic impedance, relaxation time, free length, etc.

1. Introduction

Many researchers have become interested in polyvinyl alcohol (PVA) because of its exceptional qualities, including hydrophilicity, biodegradability, biocompatibility, and nontoxicity. It is a non-toxic, water-soluble polymer that has been extensively used in numerous research fields [1-2], including biomedical and drug delivery systems [3]. Additionally, it possesses exceptional resistance to oil, grease, and solvents as well as film-forming and emulsifying properties. Due to its high hydrophilicity and processability, it might be combined with various polymers. High tensile strength, abrasion resistance, and oxygen barrier characteristics can be found in PVA films [3]. It is a potentially useful material with good charge storage, high dielectric strength, and dopant-dependent electrical and optical properties. It too has a backbone made of carbon chains with hydroxyl groups joined by methane carbon. These OH groups can serve as a hydrogen bonding source, which helps to create polymer blends and composites. One of the key elements affecting PVA's properties and uses is the water absorption it experiences. Additionally, PVA has a high density of hydroxyl groups, which act as cross-linking sites after being exposed to radiation, chemicalsor heat [4]. One of the main areas of study in both fundamental and practical aspects has been the spectroscopic and ultrasonic analysis of polymer solutions. A spectroscopic investigation that demonstrates substantial results on the polymer solution's spectroscopic and ultrasonic properties is required to modify and improve its properties.

2. Materials and methods

2.1 Materials

The polyvinyl alcohol solutions were made by adding a predetermined amount of water with a given weight of PVA. Then stirred it till to obtain clear solution. Then, the concentration was expressed in weight percent. Its range was set at 0.05 weight percent to 0.3 weight percent (i.e. 0.05wt%, 0.1wt%, 0.15wt%, 0.2wt%, 0.25wt%, and 0.3 wt%).

2.2 Methods

Using the MHF-400 pulser receiver at 2 MHz and a temperature range of 288 K to 308 K, the ultrasonic velocity was measured. Viscosity were measured by Oswald's viscometer's and density by Picknometer. With a precision of 0.1K, the temperature was maintained using a thermostatically regulated water circulation system with a Plasto Craft LTB -10 thermostat. The standard formulae shown below were used to determine various thermos-acoustical properties using experimental data on ultrasonic velocity, density, and viscosity [5-6].

RP Current Trends In Applied Sciences
Vol. 2, No. 4 (October – December 2023) pp. 84–89
e-ISSN: 2583-7486

RESEARCH PLATEAU PUBLISHERS

Cite this article: R.Y. Bakale, Y.G. Bakale, Y.S. Tamgadge, R.P. Ganorkar, S.V. Khangar, Optical properties of polymethyl methacrylate/polyvinyl chlorideblends, *RP Cur. Tr. Appl. Sci.* 2 (2023) 84–89.

Original Research Article

Optical properties of polymethyl methacrylate/polyvinyl chlorideblends

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ARTICLE HISTORY
Received: 27 July 2023
Revised: 06 Dec. 2023
Accepted: 07 Dec. 2023
Published online: 07 Dec. 2023

KEYWORDS
Optical properties;
PVC/PMMA blends;
Optical constants.

ABSTRACT
We evaluated the optical parameters of doped polymer blends (PVC / PMMA). The energy gap (E_{opt}), absorption edge, optical permittivity, refractive index, constant B, $(n_0B)^{-1}$, and N/m* are composition-dependent. Increase the dopant concentration. The refractive index (n_0) was calculated in the range of 400 to 1000 nm and its linear or nonlinear behavior was also investigated with increasing Iodine content. The ratio of carrier concentration to the effective mass (N/m*) was evaluated.

1. Introduction

Polymer composites have grown steadily in importance over the past decade. The incorporation of transition metal salts into polyvinyl polymers, either pure or mixed in multiphase systems, can lead to large changes in various parameters of the polymers [1-3]. The study of the optical absorption spectra of solids provides important information about the band structure and energy gap of crystalline and amorphous materials. Analysis of the low-energy part of the absorption spectrum provides information about the vibrations of the atom, while the high-energy part of the spectrum provides information about the electronic state of the atoms.

The refractive index is an important parameter for the design of optical components such as prisms, windows, and optical fibers [4]. Polyaniline is used in light-emitting diodes in pure or doped form photovoltaic, sensors and supercapacitors [5]. Polyaniline is widely used as a research material due to the low cost of the monomer, ease of processing, and excellent stability [6, 7]. In transparent he studied conductive metal oxide thin films. Such transparent conductors are applied in a variety of active and passive electronic and optoelectronic devices [8], from aircraft windows to charge-coupled imaging devices [9]. Photoconductivity is one of the important classes of electro-optical properties of materials. Such studies are of interest because of the wide range of technical applications and the complexity of the phenomenon [10]. Sangwar and Mohari [11] studied the electrical, thermal, and optical band gaps of polypyrrole-filled PVC: PMMA thin films, using ammonium persulfate and p-toluenesulfonic acid as oxidants, Polypyrrole was prepared from pyrrole monomer by a chemical oxidation process, as a dopant.

Patel et al. [12] studied PVC/PMMA polymer blends were characterized by Fourier Transform Infrared Spectroscopy (FTIR), UV-VIS spectroscopy, and mechanical analysis. Ahmed [13] used a solution casting technique to create transparent films from (PMMA/PVAc) mixtures of different concentrations. To show the effect of UV radiation, we performed FTIR transmission spectra on the samples. In addition, absorbance measurements were taken at room temperature over the wavelength range 190-900 nm before and after exposure to UV and filtered radiation using a xenon arc lamp.

The work was extended to also include changes in the optical parameters such as band tail width and bandgap energy of the samples. In addition, refractive indices were calculated for samples from reflection and absorption spectra before and after exposure to UV and filtered radiation. The results indicated that no absorption minima are found in the visible wavelength range, indicating that all samples are colorless. Moreover, the increase in the refractive index values after 24 hours of exposure to UV light could be attributed to the increase in local density due to photo-induced cross-linking.

2. Objectives

The general theory of light absorption by amorphous semiconductors proposed by Mott et al. [14, 15] shows that

THE RUBRICS JOURNAL OF INTERDISCIPLINARY STUDIES
International, Indexed and Peer Reviewed e-Journal
ISSN 2454-1974

THE RUBRICS
Journal of Interdisciplinary Studies
Volume 6 Issue 2 March 2024
www.therubrics.in

Development of Lung diseases monitoring system in soft computation by using IOT

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FULL PAPER

Introduction:

The rapidly evolving IoT is playing an important role in enhancing the patient centric approach. One of the areas where IoT is making a significant impact is in disease management and remote patient monitoring. This article explores the multifaceted role that IOT can play in revolutionizing healthcare, both in traditional healthcare practices and in changing patient outcomes. In this article IoT empowers healthcare providers and patients in chronic disease management as well as promotes proactive interventions and personalized treatment plans. IOT devices enable healthcare providers to identify patterns, perform advanced analytics on large volumes of data, predict disease progression and implement preventative measures. Implementation of IoT in healthcare promotes resource cost and efficiency optimization as well as creating a more streamlined and patient-centric healthcare system beyond improving patient outcomes. The role of IoT in healthcare is set to expand as technology advances and users in the era of data-driven connected and healthcare systems. In this system authors studied the patients especially related with dieses of lungs in Warud region.

Objectives

1) Assess Cost Efficiency and Resource Optimization.
2) Explore IoT's Contribution to Medication Adherence.
3) Investigate the Utilization of Data Analytics and Predictive Modeling.
4) Analyze Remote Patient Engagement through Telehealth.

THE RUBRICS JOURNAL OF INTERDISCIPLINARY STUDIES
International, Indexed and Peer Reviewed e-Journal
ISSN 2454-1974

THE RUBRICS
Journal of Interdisciplinary Studies
Volume 6 Issue 2 March 2024
www.therubrics.in

Diagnosis of COVID-19 From Chest X-Ray Images Using Deep Learning Approach

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FULL PAPER

1.Introduction

COVID-19 virus spread across the world has affected human's health as well as international economy. The rate of viral spread predicted in cites will be according to previous pandemic state. The patients above the age of 50 years with chronic diseases are at the highest risk and should therefore take special precautions. The rapid circulation of COVID-19 is one of the main fears. Till now, no specific treatment has been recommended for COVID-19. The preventive recommendations to avoid the spread of this coronavirus are Regular hand-washing, wearing of mask, keeping proper social distance, and avoiding close contact with infected people **[1]**

One of the standard diagnostic techniques is the reverse transcription-polymerase chain reaction (RT-PCR) method **[2].** Although RT-PCR can detect the severe acute respiratory syndrome coronavirus that causes COVID-19, in some cases, it created negative test results and also there is a shortage of required material and specialized personnel to perform these tests. Hence some studies have recommended the use of X-rays rather than RT-PCR. The symptoms detection of COVID-19 in the lower parts of the lungs has a higher accuracy when using X-rays.Chest X-ray is a very common, fast and cheap clinical method **[2]**. The chest X-ray gives the patient a lower radiation dose as compared to CT and MRI **[3].** Due and lower cost and radiation X-rays are part of routine patient care and are still the primary imaging test.For the diagnosis of COVID-19, Radiological imaging considered an