



NON-ASSOCIATIVE RINGS AND ALGEBRAS

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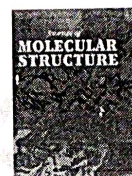
ABSTRACT:

Non associative algebras can be applied, either directly or using their particular methods, to many other branches of Mathematics and other Sciences. Here emphasis will be given to two concrete applications of non associative algebras. In the first one, an application to group theory in the line of the Restricted Burnside Problem will be considered. The second one opens a door to some applications of non-associative algebras to Error correcting Codes and Cryptography.

I. INTRODUCTION

By a non-associative algebra is meant a vector space which is equipped with a bilinear multiplication. If the multiplication is associative, we have the familiar notion of an associative algebra. Also Lie algebras are an essential tool for the study of Lie groups, as is well known. However, we shall not be particularly concerned with associative or Lie algebras today, except as models of what well-behaved non associative algebras should be. The study of algebras which are not associative is not a recent development. The 8-dimensional algebra of Cayley numbers was known as early as 1845. However, it is within the last fifteen years that the study has received its greatest impetus. With a few notable exceptions—and always excepting Lie algebras of course—there were only isolated results

before that time. By now a pattern is emerging, for certain finite-dimensional algebras at least, and this paper is an exposition of some of the principal results achieved recently in the structure and representation of finite-dimensional non associative algebras. A. A. Albert has been the prime mover in this study. The depth and scope of the results, at least for one class of non associative algebras, may be judged by the fact that N. Jacobson will give the Colloquium lectures at the Summer Meeting of the Society on the topic of Jordan algebras. Except for this reference to these two men, I shall not attempt to identify the authors of any theorems in this talk. The bibliography of the published paper will speak for itself. 2. The associative and Lie theories as models. Let F be an arbitrary field and A be a finite-dimensional associative algebra over F . It is well known that there is an ideal N called the radical of A , which is the unique maximal nilideal of A (that is, the maximal ideal consisting entirely of nilpotent elements). Furthermore, N is nilpotent in the sense that there is an integer t with the property that any product $z_1 z_2 \cdots z_t$ of t elements from N is zero; hence N is also the unique maximal



Photoluminescence studies on holmium (III) and praseodymium (III) doped calcium borophosphate (CBP) phosphors

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ARTICLE INFO

Article history:

Received 12 October 2017
Received in revised form 6 February 2018
Accepted 8 February 2018
Available online xxx

Keywords:

Calcium borophosphate
Luminescence
³¹P solid state NMR
Mono-phosphate complexes
Energy transfer
Red color emission

ABSTRACT

Using solid state reaction method, Ho³⁺ and Pr³⁺ doped calcium borophosphate (CBP) phosphors were prepared. These phosphors were characterized using XRD, SEM, FT-IR, ³¹P solid state NMR, photoluminescence (PL) and decay profiles. Structural details were discussed from XRD and FT-IR spectra. From ³¹P NMR spectra of these phosphors, mono-phosphate complexes Q⁰-(PO₄)³⁻ were observed. Photoluminescence spectra were measured for both Ho³⁺ and Pr³⁺ doped calcium borophosphate phosphors and the spectra were studied for different concentrations. Decay curves were obtained for the excited level, ⁵F₄+⁵S₂ of Ho³⁺ and ¹D₂ level of Pr³⁺ in these calcium borophosphate phosphors and lifetimes were measured. CIE color chromaticity diagrams are drawn for these two rare earth ions in calcium borophosphate phosphors. Results show that Ho³⁺ and Pr³⁺ doped CBP phosphors might be served as green and red luminescence materials.

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1. Introduction

Nowadays, the phosphors have been extensively used in the development of wide variety of display, lighting applications and other related communication technologies like UV-Visible light emitting diodes, solid state lasers and various photoluminescence materials [1,2]. Among various host materials, phosphate is an excellent host for preparation of phosphors due to various advantages such as low synthesis temperature, ease of preparation, good thermal and chemical stability and high emission brightness for solid state lighting applications. Among different emission materials, orthophosphates have good fundamental properties such as high band gap, high absorption of PO₄³⁻ in UV-visible region, low phonon energy and exceptional optical damage threshold [3,4].

Rare earth ions doped phosphors have been utilized in modern lighting and display field devices such as FED, PDP, VFDs and WLEDs [5,6]. The generation of white light is easily realized either by incorporation of tricolor phosphors (blue, green and red) with UV-emitting chips or by combination of phosphors (green and red) with blue GaN chips [7]. The pure rare earth ions have not so far been extensively used in practical applications as tunable solid state lasers or phosphors devices mainly because of their drawbacks such as low thermal and photo stability and poor mechanical properties. As a result, increasing attention has been focused on the design and synthesis of organic-inorganic hybrid composites owing to their good mechanical, thermal and chemical properties [8].

Among all rare earth ions, Ho³⁺ and Pr³⁺ ions are good luminescent centers since their energy levels have several metastable multiplets, which can emit light from the level ⁵F₄+⁵S₂ (green emission) for Ho³⁺ ion and ¹D₂ level (red emission) for Pr³⁺ ion in visible region [9,10]. Ho³⁺ and Pr³⁺ ions exhibit interesting energy level schemes and the energy levels are well separated, thus radiative transitions are favoured through the energy separation between the respective levels, which give a suitable combination for many up and down conversion processes [11].

Recently, Zhou et al. [12] initiated a study on multi-parametric thermal sensing based on NIR emission of Ho³⁺ doped CaWO₄ phosphors and reported the thermometry effect of CaWO₄:Ho³⁺ phosphors through the near infrared emission intensity of Ho³⁺: ⁵I₆ → ⁵I₈ transition at ~1190 nm. Wang et al. [13] observed luminescence properties of novel bluish green long-lasting phosphor LiBaPO₄:Eu²⁺, Ho³⁺ and achieved good persistent luminescence in LiBaPO₄ phosphor with co-doped Eu²⁺, Ho³⁺ without changing the emission band. Singh et al. [14] studied defects and optical properties of CaAl₁₂O₁₉:Ho³⁺ phosphor material and also studied thermoluminescence (TL) at different temperatures and defect centres induced by gamma irradiation. Juache et al. [15] reported luminescence properties of Pr³⁺ doped SrZrO₃ phosphors and observed that luminescence increased remarkably with higher sintering temperatures. Xiong et al. [16] studied luminescence properties of novel red-emitting phosphors LaBMO₆:Pr³⁺ and reported the photoluminescence properties of novel red emitting LaBMO₆:Pr³⁺ phosphor for the application in white LEDs. Boronat et al. [17] investigated on cathodoluminescence emission of Pr³⁺ doped LaAlO₃ phosphors reported the results obtained from the cathodoluminescence (CL) properties of undoped LaAlO₃ and LaAlO₃:RE³⁺ (RE=Dy, Pr and Eu).

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PEO based polymer composite with added acetamide, NaI/I₂ as gel polymer electrolyte for dye sensitized solar cell applications

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Abstract. Poly (ethylene oxide) (PEO) based gel polymer electrolytes (GPEs) with added acetamide, NaI/I₂ have been prepared for dye-sensitized solar cells application (DSSC). The Dye-sensitized solar cell investigated the performance of the optimized gel polymer electrolyte. GPEs synthesized by adding up of acetamide with different wt% in poly (ethylene oxide) (PEO) and poly (ethylene glycol) dimethyl ether (PEGDME) with NaI/I₂. A maximum power conversion efficiency of 5.92% is achieved for PEO/PEGDME with 10 wt% acetamide in the photovoltaic performance under 100 mW/cm² illumination and it exhibits maximum ionic conductivity ($\sigma = 2.81 \times 10^{-3}$ S/cm) among all electrolytes, compared to PEO without acetamide ($\eta = 4.35\%$). The gain in open circuit voltage (V_{oc}) was observed for GPEs due to the decrease in the recombination effect and electron lifetime increases by the addition of acetamide on the PEO. The fill factor (FF) is increased due to the growth in the ionic conductivity and amorphous nature of the GPE increases by the addition of acetamide on the PEO.

1. Introduction:

Investigate gatherings are concentrating on finding new sustainable power sources to accomplish overall energy requirements towards increasing population and emergent technology. Grätzel created a dye-sensitized solar cell (DSSC) in 1991 and delegated as 3rd generation solar photovoltaics [1]. The efficiency of DSSCs announced as high as ~13% and working process as like the rule of plant photosynthesis [2]. However, DSSC still has few issues such as unstable nature of organic solvents and combustible, stability issues because of the degradation of dyes in the photoanode, corrosion of counter electrode and severe leakage and sealing issues in pragmatic applications [3]. Along these lines, numerous specialists have been set up to substitute the liquid electrolyte by organic based materials [4, 5], ionic liquids [6, 7], solid polymer electrolytes [8, 9] and gel polymer electrolytes [10-12].

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Structural, Optical and Thermal Characterizations of PVA/MAA:EA Polyblend Films

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Received: November 04, 2017; Revised: March 19, 2018; Accepted: June 05, 2018

Films of polyvinyl alcohol (PVA), Methacrylic Acid - Ethyl Acrylate (MAA:EA) copolymer and their blends PVA:MAA:EA of composition 80:20, 60:40, 50:50, 40:60, 20:80 (wt %) were prepared by using the solution cast technique. The prepared films were investigated by structural, optical and thermal studies. X-ray diffraction (XRD) scans revealed the semicrystalline nature of the blends for lower concentrations of PVA up to 60 wt % and the amorphous nature for higher ones. Fourier transform infra-red spectroscopy (FTIR) of blend samples indicates that there is a compatibility between PVA and MAA:EA copolymers through the formation of hydrogen-bonding between their polar groups. SEM image of polymer blend suggested the presence structural reorganization of polymer chains. UV-Visible spectral analysis revealed that the intensity of the shoulder around 271 nm decreases with increasing MAA:EA content. In DSC analysis, a single glass transition temperature for each blend was observed, which supports the existence of compatibility of such systems. From the observed results, 50:50 (wt %) PVA/MAA:EA is found to be the optimum blending ratio.

Keywords: PVA/MAA:EA film, XRD, FTIR, SEM, TGA, DSC, optical and thermal parameters.

1. Introduction

Polyvinyl alcohol (PVA) is a polymer with carbon chain backbone attached with hydroxyl groups. These OH groups can be a source of hydrogen bonding and hence assist in the formation of polymer blends. PVA is non-toxic, water-soluble synthetic polymer, which is widely used in the polymer blends due to its good physical and chemical properties, excellent film forming characteristics, emulsifying capability, non-carcinogenic, biodegradable and biocompatible qualities¹. These unique characteristics enable it for its applicability in pharmaceutical fields, drug coating agents, material for surgical structures and cosmetic industries².

Nowadays, the polymer electrolytes are of immense interest because of their potential applications in the field of thin film formation, interfacial contacts, desirable sizes etc. The development of miniature electronic gadgets like mobile phones and laptops has been remarkable in the last decade to a strong need for high energy batteries. However, those polymer electrolytes are unable to satisfy certain properties such as good mechanical strength, high ionic conductivity, long - term phase stability, tensile strength, and good abrasion resistance. In order to overcome these drawbacks, copolymers (or blending of polymers) have been considered for enhancing the properties of polymer electrolytes. Polymer blend can be more useful because of its easier preparation method and its ease to control the properties of polymer electrolytes by changing the composition of the blended polymer. These polymer blends have gained an ever - increasing importance as an excellent way to develop, without chemical synthesis, new materials with improved

properties. From the scientific point of view, polymer blends can enlighten structural properties relationships helping us to understand the underlying physics of polymer interactions. Due to the importance in the field of polymer applications, special emphasis has been given to those blends in which the polymeric components are believed to be mixed at the molecular level mixtures³.

Recently, some of the polymer blend electrolytes such as (PVA - PANI)⁴, (PVA - PAN)⁵, (PVP - PVA)^{5,6}, (PMVEMA - PVA)⁷, (PVA - PEI), (PVA - PVdF), (PEO - PVA)⁷, (PVA - PAA)⁸, (PVA - PEG)⁹, (PEO - PMMA)¹⁰, (PVC - PS), (Chitosan - PVA)², (PVA - NyC), (PEMA - PVdF), (PVA - NaAlg) etc. have been studied extensively by various techniques. These polymer electrolytes satisfy most of the properties required in the field of battery applications.

Methacrylic Acid - Ethyl Acrylate (MAA:EA) copolymer has been occupied the center stage amongst the copolymers because of its good environmental stability, easier processability and transparency. MAA:EA copolymer is having a substantial charge capacity and dopant dependent electrical and optical properties¹¹. Both PVA and MAA:EA possesses film forming property. Accordingly, PVA/ MAA:EA film was thought to be a good candidate to enhance the cost to performance ratio on commercial products and of significant practical applications¹².

However, polyvinyl alcohol (PVA) - Methacrylic Acid - Ethyl Acrylate (MAA:EA) polymer blend electrolyte has yet to be studied. In the present work, structural, optical and thermal properties of PVA/MAA:EA blends in the range of composition 80:20, 60:40, 50:50, 40:60, 20:80 wt% were investigated.

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Thermophysical properties of 1-butyl-3-methylimidazolium bis (trifluoromethylsulfonyl) imide with 2-ethoxyethanol from $T = (298.15 \text{ to } 323.15) \text{ K}$ at atmospheric pressure

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ARTICLE INFO

Article history:

Received 25 September 2017

Received in revised form 27 November 2017

Accepted 5 December 2017

Available online 08 December 2017

Keywords:

1-butyl-3-methylimidazolium bis

(trifluoromethylsulfonyl) imide

2-ethoxyethanol

Redlich–Kister

FT-IR

ABSTRACT

Density (ρ) and speed of sound (u) data is determined for various binary compositions of 1-butyl-3-methylimidazolium bis (trifluoromethylsulfonyl) imide ([Bmim][NTf₂]) and 2-ethoxyethanol (2EE) at different temperatures. The experimental data of density and speed of sound is used to calculate the values of excess molar volume, excess isentropic compressibility, excess intermolecular free length and excess speed of sound. The variations in these parameters are analysed to understand the nature of molecular interactions between the chemical species. Redlich–Kister equation is used to estimate the deviations between the calculated and experimental excess values. The values of partial molar volume, excess partial molar volume and excess partial molar volume at infinite dilution have been calculated. The trends of variation of these properties have been interpreted in light of the solute–solvent interactions occurring in the system. Further, the experimental FT-IR analysis is used to study the interactions between the chemical species.

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1. Introduction

Ionic liquids (ILs), also known as green solvents, are a new class of solvents with unlimited applications in various disciplines [1–4]. The remarkable physico-chemical and recyclability properties of ILs, have made them popular “green” media for researchers [5–6]. The accurate selection of cation and anion, in the preparations of IL, enables to use it for a specific application [7]. Hence, ILs are also known as “designer solvents” having a large number of possible combinations of cation and anion. The peculiar properties of ILs like – negligible vapour pressure, more solvating capability, high electrochemical and thermal stability have made them “environmental friendly solvents” alternative to “volatile organic solvents” [8]. Further, the information about the physico-chemical properties of ionic liquid mixtures with other organic compounds is very much useful for various industrial applications.

In continuation of our previous work on ILs and their binary mixtures with organic solvents [9–12], in the present study, we have

chosen the IL – 1-butyl-3-methylimidazolium bis (trifluoromethylsulfonyl) imide ([Bmim][NTf₂]) and 2-ethoxyethanol (2EE) binary mixture. The relatively low viscous nature of imidazolium based ILs can be used for easy handling and adequate performance in extractive applications. Hence, these ILs are more environment friendly than other ILs [13]. [Bmim][NTf₂] is a preferred ionic liquid as an electrolyte for capacitive energy storage and also in the process of nuclear fuel recycling [14]. The amphiphilic organic solvents like alkoxyethanols can be utilized in several chemical applications. The liquid mixtures having alkoxyethanols are important due to the existence of –O– and –OH groups in the same compound. 2EE is used as a solvent in paints, surface coatings, inks and dyes.

The thermodynamic behaviour of solutions are very much useful to obtain information on the intermolecular interactions and geometrical effects in the mixture systems. Furthermore, the knowledge of the thermodynamic properties of binary mixtures is crucial for the proper design of industrial processes. Thus, the accurate knowledge of thermodynamic properties of [Bmim][NTf₂] + 2EE binary mixture can be of great importance for their possible use in batteries, separation technology, catalysis, synthesis of nano objects etc, [15].

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Some Relations on Degree of Vertices in the Dominating Set of the Interval Graph G by using the Euclidean Division Algorithm

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ABSTRACT:

The prominence of Interval graphs in the current times is evident from the enhanced research focus and attempts for extensive exploration during the recent years. The earnest efforts of the researchers are perceivable in the relevant establishment of the subject integrating coherent practicality and reality. Dominating sets have a vital function regarding the theory of graphs. A communication network is one of the largely discussed applications from among the diverse applications dealing with the theory of domination. In this paper, we tried to present some relations to sum of the degrees of the vertices in dominating set with quotient of an Euclidean division algorithm of divisor 3, domination number of the dominating set and the total number of vertices of the interval graph G corresponding to an interval family I.

KEY WORDS:

Dominating set, domination number, degree of vertices, Interval family, Interval graph, Euclidean division algorithm.

1. INTRODUCTION:

All graphs considered in this paper are finite, undirected, with no loop or multi edge. A graph [3, 6] is said to be a simple graph if it has no loops and no parallel edges. A graph is said to be connected if there is a path between every pair of vertices, otherwise it is said to be disconnected graph [8, 9]. The number of edges incident with a vertex V is called degree of V and is denoted by $d(v)$. Let $G = (V, E)$ be a graph, a set $D \subseteq V$ is a dominating set of G if every vertex in $V \setminus D$ is adjacent to some vertex in D. The domination number $\gamma(G)$ of G is the minimum cardinality of a dominating set [1, 4, 5, 7]. A minimum dominating set with minimum cardinality among all the dominating sets of a graph G is said to be Minimum dominating set. According to the Euclidean division algorithm [2] if we have two positive integers a and b, then there exists unique integers q and r which satisfies the condition $a = bq + r$ where $0 \leq r < b$. If a prime p divides the product ab of two integers a and b, then p must divide at least one of those integers a and b.

2. PRELIMINARIES:

Let $I = \{I_1, I_2, I_3, I_4, \dots, I_n\}$ be an interval family, where each I_i is an interval on the real line

And $I_i = [a_i, b_i]$ for $i = 1, 2, 3, \dots, n$. Here a_i is called the left end point and b_i is called the right end point. Without loss of generality, one can assume that, all end points of the intervals are distinct numbers between 1 and $2n$. An interval of degree one is called a pendent interval. The intervals are named in the increasing order of their right end points. The graph G is an interval graph if there is one-to-one correspondence between the vertex set V and the interval family I. Two vertices of G are joined by an edge if and only if their corresponding intervals in I intersect. That is if $I_i = [a_i, b_i]$ and $I_j = [a_j, b_j]$, then I_i and I_j will intersect if $a_i < b_j$ or $a_j < b_i$.

Interval graphs are rich in combinatorial structures and have found applications in several disciplines such as traffic control, ecology, biology, computer science and particularly useful in cyclic scheduling and computers storage allocation problems etc. Have a representation of graph with intervals or arcs can be helpful in combinatorial problems of the graph, such as



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Influence of an inclined magnetic field and radiation on unsteady free convective flow of a fluid through a porous medium in a channel with adiabatic

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Abstract:

In view of these, we studied the unsteady free convective flow of an incompressible viscous electrically conducting fluid through a porous medium under the action of an inclined magnetic field between two heated vertical plates by keeping one plate is adiabatic. The governing equations of velocity and temperature fields with appropriate boundary conditions are solved by using perturbation technique. The effects of various physical parameters on the velocity and temperature fields are discussed in detail with the help of graphs.

1. INTRODUCTION

The interaction between the magnetic field and the conducting fluid drastically modifies the flow, with effects on such significant flow properties as heat transfer, the fact character of which is strongly dependent on the orientation of the magnetic field. When fluid flows through a magnetic field, an electric field or consequently a current may be induced, and in turn the current interacts with the magnetic field to produce a body force on fluid. The production of this current has led to MHD power generators, MHD devices, nuclear engineering and the possibility of thermonuclear power has created a great practical need for understanding the dynamics of conducting. The influence of a magnetic field in viscous incompressible flow of electrically conducting fluid is of use in extrusion of plastics in the manufacture of rayon, nylon etc. The unsteady transient free convection flow of an incompressible dissipative viscous fluid past an infinite vertical plate on taking

into account the viscous dissipative heat under the influence of a uniform transverse magnetic field was analyzed by Sreekant et al [1]. (2001). Gourla and Katoch [2] (1991) have studied the unsteady free convection MHD flow between two heated vertical plates. Recently, Bhaskar [3] (2013) have studied the unsteady free convection MHD flow of an incompressible viscous electrically conducting fluid under the action of transverse uniform magnetic field between two heated vertical plates by keeping one plate adiabatic. MHD Poiseuille flow between two infinite parallel porous plates in an inclined magnetic field was analyzed by Manyonge et al [4] (2012). The unsteady MHD poiseuille flow between two infinite parallel plates in an inclined magnetic field with heat transfer has been studied by Idowu et al [5] (2014). Simon [6] (2014) have investigated the effect of heat of transfer on unsteady MHD couette flow between two infinite parallel porous plates in an inclined magnetic field.

However, flow through a porous medium has been of significant interest in recent years particularly among geophysical fluid dynamicists. Examples of natural porous media are beach sand, sand stone, limestone, rye bread, wood, the human lung, bile duct, gall bladder with stones and in small blood vessels. Influence of MHD and radiation effects on oscillatory flow through a porous medium with constant suction velocity has been studied by El-Hakeem [7] (2000). Makinde and Mhone [8] (2005) have investigated the heat transfer and MHD effects on an oscillatory flow in a channel filled with porous medium.

Recently Raghunath and Siva Prasad [9] have investigated Heat and mass transfer on MHD flow of Non-Newtonian fluid over an infinite vertical

MULTIVARIATE CONVECTIVE HEAT AND MASS TRANSFER PAST A VERTICAL PLATE THROUGH A POROUS MEDIUM IN CONDUCTING FIELD.

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ABSTRACT

In this manuscript, an attempt is made to study the Multivariate convective heat and mass transfer past a vertical plate through a porous medium in conducting field. The expressions for velocity, temperature and concentration distribution, skin-friction, rate of heat and mass transfer coefficients at the plate are obtained using perturbation technique. The effect of various physical parameters occurring into the problem on velocity, temperature and concentration fields are discussed with the help of graphs.

Key words: MHD, Chemical reaction, Radiation, Visco-elastic, Radiation absorption, Skin-friction.

1. INTRODUCTION

MHD is a fluid dynamics of a plasma which can carry an electric current. The interaction with this current and the magnetic field generated by the current, as well as externally imposed magnetic fields, give MHD its rich character which adds to underlying fluid dynamics. Although the plasma can carry a current, it remains electrically neutral throughout the course of its dynamics. The ideas of fluid dynamics in general are presented in heuristic detail, with emphasis on the conservation properties. At this point the electrons and positive ions which make up a completely ionized, neutral plasma are treated as separate, ideal (dissipation-free) fluids. Then, the conditions under which the plasma may be treated as a single, current-carrying fluid are listed, and the system of equations that make up ideal MHD is presented.

The important properties of ideal MHD are conservation of magnetic flux, the concept of a flux tube, essential dynamics of magnetic pressure and shear waves, or Alfvén waves. The relevant time and spatial scales are derived, and then the validity of MHD is addressed in terms of these parameters. One important parameter, the so-called "plasma beta", which is the ratio of fluid pressure to magnetic field pressure, is discussed at length. Finally, the effect of introducing electrical resistivity is addressed; resistivity is a dissipative momentum transfer between electrons and ions which acts as a magnetic diffusivity, relaxing the flux conservation property especially at very small scales.

Unsteady MHD Convective flow of Rivlin-Ericksen Fluid over an Infinite Vertical Porous Plate with Absorption Effect and Variable Suction was studied by Veera Sankar et al. [1]. Sharmilaa [2] Studied Mhd Mixed Convective Flow in Presence of Inclined Magnetic Field and Thermal Radiation With Effects of Chemical Reaction and Soret Embedded in A Porous Medium. Unsteady MHD Mixed Convection Flow of Jeffrey Fluid Past a Radiating Inclined Permeable Moving Plate in the Presence of Thermophoresis Heat Generation and Chemical Reaction was discussed by Venkateswara raju et al. [3]. Unsteady MHD Free Convection Flow of a Viscoelastic Fluid Past a Vertical Porous Plate. International Journal of Dynamics of Fluids was studied by Gurivi Reddy [4]. Reddy [5] studied MHD boundary layer flow, heat and mass transfer analysis over a rotating disk through porous medium saturated by Cuwater and Ag-water nanofluid with chemical reaction. Magnetohydrodynamic (MHD) mixed convection flow of micropolar liquid due to nonlinear stretched sheet with convective condition was discussed by Waqas et al. [6]. Rashad et al, [7] studied by MHD mixed convection of localized heat source/sink in a nanofluid-filled lid-driven square cavity with partial slip.

Chemical reaction engineering (reaction engineering or reactor engineering) is a specialty in chemical engineering or industrial chemistry dealing with chemical reactors. Frequently the term relates specifically to catalytic reaction systems where either a homogeneous or heterogeneous catalyst is present in the reactor. Sometimes a reactor per se is not present by itself, but rather is integrated into a process, for example in reactive separations vessels, retorts, certain fuel cells, and photocatalytic surfaces. The issue of solvent effects on reaction kinetics is also considered as an integral part. Reactor Design uses information, knowledge and experience from a variety of areas - thermodynamics, chemical kinetics, fluid mechanics, heat and mass transfer and economics. Chemical Reaction Engineering is the synthesis of all these factors with the aim of properly designing a Chemical Reactor.

Effects of Chemical Reaction on Unsteady MHD Casson Fluid flow past a moving Infinite Inclined Plate through Porous Medium was studied by Balakrishna et al. [8]. Rama Mohan et al. [9] Studied chemical reaction and thermal radiation effects on unsteady MHD free convection flow past an inclined moving plate with TGHS. Arifuzzaman et al. [10] was discussed chemically reactive and naturally convective high speed MHD fluid flow through an oscillatory

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Radiation Absorption and Chemical Reaction Effects on MHD Radiative Heat Source/Sink Fluid Past a Vertical Porous Plate

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ABSTRACT

An analysis of radiation absorption and chemical reaction effects on unsteady MHD radiative heat source/sink fluid past a vertical porous plate have been discussed. The dimensionless governing equations are linear and coupled. These equations are solved analytically by using perturbation technique. The expressions for velocity, temperature and concentration are obtained and discussed their variations under several parameters through graphs. The skin-friction, rate of heat transfer in the form of Nusselt number and the rate of mass transfer in the form of Sherwood number are also derived and discussed through tables.

Key words: Radiation absorption, Chemical reaction, MHD, Heat source/sink, Porous plate.

Date Of Submission: 09-05-2019

Date Of Acceptance: 24-05-2019

1. INTRODUCTION

The study of magneto hydrodynamics (MHD) plays an important role in agriculture, engineering and petroleum industries. MHD has won practical applications, for instance, it may be used to deal with problems such as cooling of nuclear reactors by liquid sodium and induction flow water which depends on the potential difference in the fluid direction perpendicular to the motion and goes to the magnetic field and also study of MHD of viscous conducting fluids is playing a significant role, owing to its practical interest and abundant applications, in astro-physical and geo-physical phenomenon. Astro-Physicists and geo-physicists realized the importance of MHD in stellar and planetary processes. The main impetus to the engineering approach to the electromagnetic fluid interaction studies has come from the concept of the magneto hydro dynamics, direct conversion generator, ion propulsion study of flow problems of electrically conducting fluid, particularly of ionized gases is currently receiving considerable interest. Such studies have made for years in convection with astro-physical and geo-physical problems such as Sun spot theory, motion of the interstellar gas etc. Recently, some engineering problems need the studies of the flow of an electrically conducting fluid, in ionized gas is called plasma. Many names have been used in referring to the study of plasma phenomena.

The MHD generation process is based on Faraday's electro-magnetic induction law. So Magneto-hydrodynamic generator generates thermal energy or kinetic energy of a moving conducting fluid into directly electrical energy. Examples of such kind of fluids are ionized gas, plasma, liquid metals, and seawater. It's a plasma technology. The gas is continuously seeded with potassium nitrate, making the gas electrically conductive at lower temperatures. The alkali metal ionizes easily at lower temperatures. MHD generators are different from conventional electric generators in that they can operate at high temperatures without moving parts.

Unsteady MHD convective flow of rivlin-ericksen fluid over an infinite vertical porous plate with absorption effect and variable suction was studied by Veera sankar et al. [1]. Anuradha Punithavalli [2] studied the MHD boundary layer flow of a steady micro polar fluid along a stretching sheet with binary chemical reaction. Rama Krishna Reddy et al. [3] have examined the MHD free convective flow past a porous plate. Karuna Dwivedi et al. [4] have investigated the MHD flow through a horizontal channel containing porous medium placed under an inclined magnetic field. Chandra Reddy et al. [5] studied the MHD natural convective heat generation/absorbing and radiating fluid past a vertical plate embedded in porous medium – an exact solution.

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Review Article

**Phytochemical Screening and Antioxidant activity of aqueous extract
Of *Allophylus serratus* fruit.**

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Abstract: The present work aimed to determine the quantitative screening of phytochemicals and Antioxidant activity of *Allophylus serratus* fruit aqueous extract (A.S.Fr.). Results showed the presence of phenolic compounds, flavonoids, alkaloids, phenols and proteins in the extract and showed antioxidant capacity with high amounts of Total phenolic content (63.60 ± 0.88 mg GAEg⁻¹), Total flavonoid content (44.51 ± 0.46 mg QEg⁻¹). The radical scavenging activity measurement, done by DPPH assay ($EC_{50} = 29.24 \pm 0.18$ µg/mL) and ABTS assay ($EC_{50} = 21.64 \pm 1.35$ µg/mL) revealed that, fruits of *Allophylus serratus* found to be potential source of natural antioxidants and therefore, recommended for utilization as natural nutritional supplemented medicine which supported the traditional claim by herbal healers.

Keywords: *Allophylus serratus*, Aqueous extract, Antioxidant Activity,

Introduction

Phytochemical processing of raw plant material is essentially requisite to optimize the concentration of known constituents and also to maintain their activities. Recently, interest has noticeably amplified in finding naturally occurring antioxidant to replace synthetic antioxidants (Benabdallah *et al.*, 2016). Nutraceutical and herbal medicine prominence is typically allied to their antioxidant power, which can be determined by spectrophotometric methods that can be influenced by phytocompounds which demonstrate antioxidant behavior (Oliveira Neto *et al.*, 2017; Leite *et al.*, 2018).

Awareness of medicinal plant usage is a result of the many years of struggle against diseases and man learned to pursue drugs in barks, seeds, fruits, and other parts of the plants (Srivastava, 2018). By combining the knowledge derived from traditional medicinal practices with modern science, the possibilities for drug disc-

overy and use of plants in the treatment of wide array of conditions seems endless (Reid *et al.*, 2018). In a way to find the substitute of synthetic anti-oxidant drugs and after perusal of literature and by enquiring traditional therapists, Village vaidyas, Ayurvedic physicians, it was found that some of the local plants were used as medicine in different dosage, with admixtures of other material for protection against oxidative stress, body abnormalities, Lithergic conditions, Indigestion, constipation etc., without knowing the hidden biomolecules which act inside the body. It is interesting to document and reveal the bio constituents and its antioxidant potency in the naturally available sources.

In our recent Medicobotanical studies conducted during (2016-2018) around Sri Kalahasti area of Chittoor dt. in Rayalaseema region the Natu-Vaidhyas, Village herbalists, Traditional herbal

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 <http://dx.doi.org/10.21746/ijbpr.2019.8.1.2>



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Phytochemical Screening and Antioxidant activity of aqueous extract Of *Allophylus serratus* fruit.Radhaiah A^{1*}, Padmavathi S¹ and Sailaja Rani V.J.²¹Government Degree College, Nagari- 517590, Chittoor Dt. Andhra Pradesh, India.²PSC & KVSC Government Degree College, Nandyal -518502, Kurnool Dt., Andhra Pradesh, India.

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ADAPTIVE ROBOTIC NEURO-REHABILITATION HAPTIC DEVICE FOR MOTOR AND SENSORY DYSFUNCTION PATIENTS

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ABSTRACT

A study of Christopher¹ et.al., stated that millions of people are affected by motor and sensory dysfunction across the globe. An individual's standard of living is adversely affected with motor and sensory dysfunction. This research focuses on the current state-of-the-art robotic devices in vogue for neuro-rehabilitation of motor and sensory dysfunction patients. A combined qualitative and quantitative object-oriented case study is conducted with a population having mild to severe dysfunction. The inclusion criteria for sampling of study population are as follows: Patients with gross motor functional disability, developmental stage and chronic symptoms stage with a stable cardio-pulmonary state. Inexpensive miniature robotic devices like exoskeletons and end-effectors are considered in the present research as they facilitate tele-rehabilitation also. The double-folded aim of this study focuses on the following points: The extent to which the present robotic devices are sufficing the needs of patients with motor and sensory dysfunction and the scope of designing and developing a cost-effective neuro-rehabilitation haptic device to suffice the needs in a better way. The clotting of the blood in the brain is the root causal factor for motor and sensory dysfunction. If the drug is delivered on-time before the blood completely clots, severe damage to the motor and sensory nerves can be controlled and hence the dysfunction of body parts can be avoided. The current study also aims at developing neuro-rehabilitation haptic device which delivers drug on-time, and it is further studied in comparison with the current state-of-the-art robotic devices. Robotic device aided neurotic study post brain-trauma contributed for deciphering the brain-plasticity and efficacy of these technologies. It is concluded that the presently developed neuro-rehabilitation haptic device is superior in terms of performance, comparatively. Comparative study showed promising results in the neuro-rehabilitation of patients with sensory and motor dysfunction.

KEYWORDS: Robotics, Neuro-rehabilitation, Haptics, Motor & Sensory Dysfunction

Received: Aug 03, 2019; Accepted: Aug 23, 2019; Published: Oct 10, 2019; Paper Id.: IJMPERDDEC201911

1. INTRODUCTION

In the current scenario, robotic devices are gaining their momentum in assisting the patients with motor and sensory dysfunction. This paper presents the various Neuro-rehabilitation motor and sensory assessments that are in practice as on date. The satisfactory levels of the patient, after utilizing the haptic devices are not considered by the current assessment practices. Hence, the current research brings the term 'Satisfactory Index (SI)' into picture, which represents the satisfaction of the patient in using the assistive neuro-rehabilitation devices. The rehabilitation techniques that are in use at present, like site-based drug delivery, occupational therapy, physio-therapy and massage therapy are limited in terms of applicability and performance. Hence, there is a need for development of a novel neuro-rehabilitation haptic device for motor and sensory dysfunction

Benefits of Renewable Energy Sources to the Environment

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ARTICLE DETAILS

Article History

Published Online: 25 January 2019

Keywords

Non-Conventional Sources, Environment,
Renewable energy, fossil fuels.

ABSTRACT

All non-renewable energy sources have great impact on Environment. Non-Renewable energy sources (fossil fuel, Petrol, Coal, natural gas, oil, etc.) will become great threat to us in the future. We have to explore another alternative to produce electricity. Renewable energy sources (solar, wind, Geothermal, Biomass, Hydrothermal, Ocean, etc ;) will be that problem. With electricity became a basic requirement from day to day, renewable sources will become a good solution not only for our requirement but also to the environment. This review paper briefly describes, Why should we have to prefer renewable energy sources than non-renewable energy sources?. The effects we will face in the future by using non-renewable sources and how we will be benefited by renewable energy sources.

1. Introduction

Carbon is the main element in fossil fuels. For this reason, the time period that fossil fuels formed (about 360-300 million years ago) is called the Carboniferous Period. Over time, the dead plants were crushed under the seabed. Rocks and other sediment piled on top of them, creating high heat and pressure underground. In this environment, the plant and animal remains eventually turned into fossil fuels i.e. coal, natural gas, petroleum. These are abundant and inexpensive but impossible to reuse. When they are burnt, they produce large amount of carbon dioxide into the atmosphere. This gas is the greatest defaulter in producing global warming. The carbon dioxide keeps the heat in the atmosphere of the earth. This process is called the "greenhouse effect." Life on Earth requires heat to survive, but it is based on a balanced carbon budget. To protect Environment, control pollution and the potential for global warming may encourage wider access to alternative energy sources such as renewable energy source [1]. All these sources are renewable process of energy generation and do not cause environmental pollution.

2. Environmental impact of non-renewable energy source

There are two types of sources for producing electric power energy.

- Conventional Sources (Non renewable sources)- fossil fuel, Petrol, Coal, natural gas, Oil
- Non Conventional Sources (renewable sources)- solar, wind, Hydro, Geothermal, Biomass, Hydrothermal, Ocean, Tidal Energy.

For industrialized nations like the United States, without fossil fuels, we can not imagine modern life. The majority of our

transport and heating, and the power stations we use to generate electricity depend on burning coal, oil or natural gas.. However, fossil fuel production also carries severe economic, environmental and social costs.. Whenever we burn a fossil fuel, we are producing more carbon dioxide, toxic gases into the atmosphere, resulting in potentially devastating long-term contamination of land, air and water resources.

Acid rain refers to precipitation that carries sulfur and nitrogen compounds from the atmosphere to the ground. Negative environmental consequences include damage to vegetation and declining aquatic populations. Decreased agricultural production is also likely, since acid rain depletes the soil of nutrients that crops need to grow.

The temperature in the atmosphere increases due to the greenhouse effect. The result is an increase in global temperatures, the U.S. Environmental Protection Agency states. This phenomenon of climate change is associated with floods and heavy rain falls in many regions, as well as more frequent droughts and severe heat waves.

Fossil fuels are a major contributor to health-harming air pollution. The combustion process also creates nitrogen oxides that lead to the creation of smog, These materials can cause bronchitis and pneumonia, decrease resistance to respiratory infections and irritate the lungs. Power plant and transportation-related activities are about equally responsible for nitrogen oxide emissions

Coal-fired power plants also release pollutants that contaminate nearby soils. The transportation of oil raises the risk of spills that leave oceans and waterways uninhabitable for years to come [2].


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**A SIMPLE SPECTROPHOTOMETRIC ASSAY OF EDARAVONE IN BULK SAMPLES****G. Srihari¹, U. Sreenivasulu^{1*}, K. Prabhavathi¹ and N. Rami Reddy¹**¹Department of Chemistry, S.B.S.Y.M. Degree College, Kurnool, A.P-518004, India.Article Received on
21 Jan. 2019,Revised on 11 Feb. 2019,
Accepted on 04 March 2019

DOI: 10.20959/wjpr20194-14430

Corresponding Author*U. Sreenivasulu**Department of Chemistry,
S.B.S.Y.M. Degree College,
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upparapallisrinivasulu@gmail.com**ABSTRACT**

A simple, sensitive, rapid and accurate colorimetric method has been developed for the estimation of edaravone in bulk and pharmaceutical dosage forms. The proposed method was based on the formation of chloroform extractable complex of edaravone with wool fast blue. The absorbance of the extractable ion pair complex is measured at the wavelength of maximum absorbance 585 nm against the reagent blank. Results obtained are statistically validated and found to be reproducible.

KEYWORDS: Spectrophotometry, Wool fast blue, edaravone, Pharmaceutical and Formulation

INTRODUCTION

Edaravone (EDR) is a well-recognized lipophilic free radical scavenger for diseases including neurodegenerative disease, cardiovascular disease, and cancer. However, its oral use is restricted due to poor oral bioavailability. Literature survey reveals that a specific, sensitive and fast method based on reverse phase high performance thin layer liquid chromatography (RP-HPTLC)^[1], HPLC^[2-3] HPTLC^[4] and LC-MS/MS^[5] for the determination of edaravone in human, rat plasma and pharmaceutical formulations. No analytical methods reported so far for the estimation of edaravone in pharmaceutical formulations.

MATERIALS AND METHODS**Instrument**

All measurement were done on Milton Roy 1001 spectrophotometer by using 10 mm matched quartz cuvettes.

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A SIMPLE SPECTROPHOTOMETRIC ESTIMATION OF EDARAVONE IN BULK SAMPLES

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Article Received on
02 August 2019,

Revised on 22 August 2019,
Accepted on 12 Sept. 2019,

DOI: 10.20959/wjpps201910-14812

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ABSTRACT

A simple, sensitive, rapid and accurate colorimetric method has been developed for the estimation of edaravone in bulk and pharmaceutical dosage forms. The method is based on the reaction of edaravone with 2, 3-dichloro-5, 6-dicyano-1, 4-benzquinone (DDQ) to form an orange red coloured charge-transfer complex. The orange red colour solution is used to determine the edaravone spectrophotometrically. Results obtained are statistically validated and found to be reproducible.

KEYWORDS: Spectrophotometry, 2, 3-dichloro-5, 6-dicyano-1, 4-benzquinone, edaravone, Pharmaceutical and Formulation.

INTRODUCTION

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మహబూబ్ నగర్ కథలు - దళిత, గిరిజన, బహుజన జీవన చిత్రణ

- డా॥ డి. మల్లయ్య తెలుగు అధ్యాపకులు, పి.యస్.సి & కె.వి.ఎస్.సి, ప్రభుత్వ డిగ్రీ కళాశాల, నంద్యాల, కర్నూలు జిల్లా.

1902 లో తెలుగు కథానిక పుట్టింది. 1910 లో తెలుగు కథానికా ప్రవాహం మొదలైంది. 1925 లో తెలుగు దళిత కథానిక వెలువడింది. తెలుగు నేలలో ఈ కథానిక పుట్టినాటికి ఆంధ్రదేశంలో సంఘ సంస్కరణ జాతీయోద్యమాలు బలంగా సాగడం, కుల సమానత వేదికమీదకు రావడం, అస్పృశ్యత ప్రధాన స్రవంతి కావడం, దళితులు ఆలోచనాపరులు కావడం, తాము కోల్పోతున్న హక్కులను గుర్తించడం, హిందూవాదాన్ని ప్రశ్నించడం, అగ్రవర్ణ దౌర్జన్యాన్ని వ్యతిరేకించడం లాంటి అంశాలు మొదలయ్యాయి.

ఆ తర్వాతి కాలంలో దళితులు చైతన్యవంతం కావడం అస్పృశ్యతను వ్యతిరేకించే ఉద్యమాలలో భాగస్వాములు కావడం, భౌతిక వాదం మాటన ముందుకు సాగడం, తమ ఉనికిని మార్పుకొనే ప్రయత్నం చేయడం, దళిత ఉద్యమాలను బలోపేతం చేయడం, దళితులపై సాగే హింసను

అత్యాచారాలను ప్రతిఘటించడం, తమ హక్కులను కాపాడుకొనే ప్రయత్నం చేయడం, ఆ ప్రయత్నంలో సవర్ణుల నుండి దళితులు తీవ్ర హింసను ఎదుర్కొనడం, హత్యలకు గురికావడం, దళితుల ఆత్మగౌరవ పోరాటాలు సాగడం లాంటి అంశాలు గత శతాబ్దాన్ని బాగా కుదిపేశాయి. ఇలాంటి గత శతాబ్ది సంఘటనలన్నింటికీ తెలుగు కథానిక సాక్షిభూతంగా నిలిచింది. గ్రామీణ సమాజంలోని దళితులు, వారి జీవన స్థితి, గాయాలు, చేస్తున్న పోరాటాలు, పొందుతున్న లాభాలు, చేయాల్సిన పోరాటాలు.... ఇలా వీటన్నిటిని రచయితలు తమ కథానికల ద్వారా రికార్డు చేసే ప్రయత్నం చేశారు. తెలుగు కథానికలో భాగంగా వచ్చిన మహబూబ్ నగర్ జిల్లా కథా సాహిత్యంలో కూడా ఇవన్నీ చిత్రీకరించబడ్డాయి.

మహబూబ్ నగర్ నిజాము ఏలుబడిలో వుండడం వల్ల ప్రజాజీవనంలో కొన్ని ప్రత్యేక పరిస్థితులు కనిపిస్తాయి.

ఉన్నత వర్గాల వారు జాగీర్దార్లకు దగ్గరగా ఉండేవారు. వారి ద్వారా నిజాము ప్రభుత్వానికి కూడా దగ్గర కాని దళిత, బహుజనులకు అటువంటి అండ లేనే లేదు. వాళ్ళు నిజాము పోలీసుల దోపిడీకి గురయ్యారు. ఈ దోపిడీని మహబూబ్ నగర్ జిల్లా కథకులు తమ కథల ద్వారా వ్యంగ్యంగా శక్తివంతంగా చిత్రించారు.

మహబూబ్ నగర్ జిల్లాలో వివిధ ప్రక్రియల్లో గొప్ప రచనలు రావడం వెనుక అక్కడి ఉద్యమాలు ప్రధానంగా దోహదం చేశాయి. ఈ ఉద్యమాల్లో దళిత, బహుజనులు సాహసోపేతంగా పాల్గొన్నారు. నిజాం వ్యతిరేక పోరాటంలో వారి సాహస కార్యాలను ముఖ్యంగా తొలి తరం కథా రచయితలు గొప్పగా చిత్రించారు. అనంతర తరానికి చెందిన రచయితలకు నక్సలైట్ ఉద్యమంలో భూమి కోసం భుక్తి కోసం సాగిన పోరాటం కథా వస్తువైంది. ఈ కథల్లోనూ దళితులు, బహుజనుల త్యాగాలు చిత్రించబడ్డాయి.

మహబూబ్ నగర్ నుండి బొంబాయి ఆ పరిసర ప్రాంతాలకు వలస వెళ్ళిన పేదల బాధలపై అనేక కథలు వచ్చాయి. జీవనం గడవక పొట్టచేత బట్టుకొని వలస వెళ్ళక తప్పని పరిస్థితులొకవైపు, తల్లితండ్రీ, ఊరువాడా వదలి దూరదేశం వెళ్ళలేక మరోవైపు పడ్డ వేదనను చిత్రిస్తూ కథలు రాసిన వారిలో గొరుసు జగదీశ్వరరెడ్డి (వలస పక్షులు); జనజ్వాల (... ఎడమకాలు చెప్పే జారింది, పిచ్చి పిల్ల); కోట్లవనజాత (సముద్రం); డా॥ భీంపల్లి శ్రీకాంత్ (వలసజీవులు); ఉదయమిత్ర (పేగు బంధం, అమ్మను జూడాలె....., పట్నం వచ్చిన ఎలుక) వంటి వారున్నారు.

పాలమూరు కథారచయిత గొరుసు జగదీశ్వర రెడ్డి రాసిన 'వలస పక్షులు' కథలో సగటు వలస కూలీలు వలస వెళ్ళక అక్కడ కాంట్రాక్టర్ల దురాగతాలకు ఎలా బలైపోతారనేది ఈ కథలో ప్రధాన ఇతివృత్తం. పాలమూరు కరువు నేపథ్యంలో తన తండ్రిని పోగొట్టుకున్న

మహబూబ్ నగర్ కథలు - ప్రపంచీకరణ అనుభవాలు

- డా॥ డి. మల్లయ్య తెలుగు అధ్యాపకులు, పి.ఎస్.సి & కె.వి.ఎస్.సి, ప్రభుత్వ డిగ్రీ కళాశాల, నంద్యాల, కర్నూలు జిల్లా.

ఒక దశాబ్దం కాలంనాటి మన చుట్టూ ఉన్న ప్రజా జీవన సరళికి, నేటి జీవన విధానానికి ఉన్న తేడాను పరిశీలించి చూసినపుడు రెండింటికీ మధ్య వ్యత్యాసం ఎంత వుందో స్పష్టంగా అర్థమవుతుంది. వేషభాషలు, ఆహారపు అలవాట్లు, విద్యావిధానం, మొదలైనవి తమ తమ స్వాభావిక రూపాల్ని మార్చుకుంటూ వింత నాగరికతవైపు దృష్టి పెట్టి సంపదలవైపు, సౌఖ్యాల వైపు మనిషిని ప్రేరేపిస్తున్న కొత్త ఆలోచనా విధానమే ప్రపంచీకరణ ప్రభావం. మానవతా విలువల్ని మంటగలుపుతూ, మనిషి వ్యక్తిత్వాన్ని వేటకొడవళ్ళతో నరుకుతూ తెలుగు సమాజాన్ని ఆక్రమిస్తున్న ఈ ప్రపంచీకరణ దుశ్చర్యల్ని ఎదుర్కొనే శక్తిలేక మనకెందుకులే అంటూ మౌనంగా చూస్తున్నవారు కొందరైతే ఈ పాశ్చాత్య ప్రపంచీకరణ ఘాటుకు ఊపిరాడక నలుగుతున్న వారు కొందరు. ఈ విపరీత ధోరణులకు ఎదురుతిరిగి తుపాకీ తూటాలకు ప్రాణాలు విడుస్తున్న వారు మరికొందరు.

1990 నుండి ప్రపంచీకరణ భారతదేశ అస్తిత్వానికి పెద్ద సవాలుగా మారింది. దేశీయమైన జీవనంలో ప్రతి అంశాన్ని విదేశీయం చేయడానికి ప్రపంచీకరణవాదులు ప్రయత్నిస్తున్నారు. ప్రతి వస్తువును అమ్మకం సరుకుగా చేస్తూ మనుషుల మధ్య ఎత్తైన డబ్బు గోడలు కడుతూ మానవత్వపు విలువల్ని ప్రపంచీకరణ ధ్వంసం చేస్తుంది. తెలుగు కథానిక ఆవిర్భవించిన నాటి నుండి సమకాలీన పరిస్థితుల్ని, సంఘటనల్ని, నూతన పోకడల్ని విమర్శిస్తూ ముందుకు సాగింది. అదే క్రమంలో ప్రపంచీకరణ దుశ్చర్యల్ని ఎండగట్టడానికి గురుజాడ వారసత్వాన్ని మహబూబ్ నగర్ కథాసాహిత్యంకొనసాగించింది. ఈ ప్రపంచీకరణ సృష్టిస్తున్న విధ్వంసాన్ని ప్రజలకు తెల్పడానికి మహబూబ్ నగర్ కథానికా రచయితలు కొందరు స్వచ్ఛందంగా ముందుకొచ్చారు. అయితే అలాంటి కథలు రాస్తున్న రచయితలందరికీ ప్రపంచీకరణ గురించి, దానిలో ఇమిడి

ఉన్న అంశాల గురించి, దాని ఫలితం గురించి స్పష్టంగా తెలియకపోయినా నేడు మార్కెట్ లోకి వస్తున్న సరికొత్త వస్తువులు, రంగుల్ని ఒకకబోసే టి.వి.లు, వాటి ద్వారా ప్రజల్ని ఆకర్షిస్తున్న కొత్త జీవనశైలి, సరికొత్త మానవ సంబంధాలు మనిషిని మార్కెట్ శక్తిగా మలుస్తున్న తీరు కథా రచయితలకు ప్రపంచీకరణ అంటే ఏమిటో ఒక అవగాహన కల్గించాయి. తత్ఫలితంగా ఎన్నో కొత్తకథలు మహబూబ్ నగర్ కథా ప్రపంచంలో అడుగుపెట్టాయి. చేతివృత్తులు నాశనమైపోయి వాటిని నమ్ముకున్న వాళ్ళు వీధిన పడడం, చేనేత కార్మికుల ఆత్మహత్యలు, వ్యవసాయ దారుని నడ్డి విరిచే ప్రయత్నాలు, అభివృద్ధి కార్యక్రమాల్లో, యంత్రాల్ని ఉపయోగించడం, చదువంటే కంప్యూటర్ విద్యనుకోవడం, కంప్యూటర్ ఉద్యోగాలు చేసే వారి జీవనశైలి తక్కిన ప్రపంచంనుండి వారు విడిపోయినట్లుండడం, ఇటీవల కాలంలో వచ్చిన సెజ్, ప్రాజెక్టుల వల్ల రోడ్డున పడ్డ ప్రజలు, విద్యారంగంలో ధనస్వామ్య లక్షణాల ప్రవేశం మొదలైన అంశాలపై మహబూబ్ నగర్ జిల్లా నుండి ఎన్నో కథలు వచ్చాయి.

1. ప్రపంచీకరణ కథలు- చేతివృత్తుల విధ్వంసం:

స్వేచ్ఛా వాణిజ్యాన్ని ప్రోత్సహిస్తున్న ప్రపంచీకరణ విధానంలో తొలిదెబ్బ దేశీయమైన చేతివృత్తులపై, చిన్న చిన్న వ్యాపారులపై పడింది. చిన్న చిన్న వృత్తులతో బ్రతుకు బండిని నడిపిస్తున్న ప్రజల నడ్డి విరగొట్టిన ప్రపంచీకరణ ప్రయత్నాలను మహబూబ్ నగర్ కథా రచయితలు దుయ్యబట్టారు.

ఇటీవలి కాలంలో గ్రామాల్లో కరువు నివారణ కోసం ప్రభుత్వం ప్రవేశపెట్టిన 'ఉపాధి హామీ పథకం' కూడా గ్రామ పెత్తందార్లు, రాజకీయ నాయకుల చేతుల్లోపడి పేద ప్రజల శ్రమను ఎలా దోచుకుంటుందో దాసరి రాజేంద్ర కుమార్ రాసిన 'కోత' కథ తెల్పుతుంది.

భావవీణ మాసపత్రిక



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COMPLEMENTARY DOMINATING SET OF AN INTERVAL GRAPH USING EUCLIDEAN DIVISION ALGORITHM

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Abstract: If D is a Dominating set then $D^c = V \setminus D = \{x \in V / x \notin D\}$ is a Complement of a Dominating set. In this paper we concentrated on the Complement of a Dominating set of the Interval Graph and tried to present the some relations to sum of the degrees of the elements in a Complement of a Dominating set with the quotient of an Euclidean division algorithm of divisor 3, complementary domination number, the number of vertices of an Interval Graph corresponding to an Interval family I .

Keywords: Dominating set, Complement of a Dominating set, Interval family, Interval Graph, Euclidean division algorithm.

I. INTRODUCTION

Domination[1] in graphs has applications to several fields. Domination arises in facility location problems, where the number of facilities is fixed and one attempts to minimize the distance that a person needs to travel to get to the closest facility. A similar problem occurs when the maximum distance to a facility is fixed and one attempts to minimize the number of facilities necessary so that everyone is serviced. Concepts from domination also appear in problems involving finding sets of representatives, in monitoring communication or electrical networks[9], and in land surveying. All graphs considered in this Paper are finite, undirected, with no loop or multi edge. A graph is said to be a simple graph if it has no loops and no parallel edges. A graph is said to be connected if there is a path between every pair of vertices, otherwise it is said to be disconnected graph.

II. PRELIMINARIES

Let $G = (V, E)$ be a graph, a set $D \subseteq V$ is a dominating set[1] of G if every vertex in $V \setminus D$ is adjacent to some vertex in D . The domination number $\gamma(G)$ of G is the minimum cardinality of a dominating set. The number of edges incident with a vertex V is called degree of V and is denoted by $d(v)$. If $d(v) = 1$ then the vertex v is said to be a pendent vertex. If $d(v) = 0$ then the vertex v is said to be an isolated vertex. A dominating set D of a graph G is a non-split dominating set[6] if the vertex induced sub graph $\langle V - D \rangle$ is connected. A dominating set D of a graph G is called a split dominating set if the vertex induced sub graph $\langle V - D \rangle$ is disconnected. If D is a set, then the absolute complement of D (or simply the complement of D) is the set of elements not in D . In other words, if V is



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SUM OF THE DEGREES OF AN INTERVAL GRAPH USING EUCLIDEAN DIVISION ALGORITHM

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Abstract: A set $D \subseteq V$ is called dominating set, if every vertex in $V \setminus D$ is adjacent to some vertex in D . The domination number γ of G is the minimum cardinality of a dominating set and then $D^c = V \setminus D$ is also a Dominating Set which is called Complementary Dominating set and γ^c be the complimentary domination number of G . In this paper we tried to present the sum of the degrees of the elements in a Vertex Set of an Interval Graph corresponding to an Interval family I through its Dominating Set and Complementary Dominating set using an Euclidean division algorithm.

Keywords: Dominating set, Complement of a Dominating set, Interval family, Interval Graph, Euclidean division algorithm.

I. INTRODUCTION

Dominating sets plays predominant role in theory of Graphs. In general the concept of dominating sets in the Graph theory finds wide application in different types of communication networks[2, 3, 5]. A serious study of domination graphs was first witnessed in the year 1950 in the context of a problem in game of chess, where the placement of minimum number of queens on an $n \times n$ chess board in such a way as to cover or dominate each square. The researchers toiled for over a decade till 1960 to arrive at some serious comprehension and study of domination graphs[1, 6, 13]. Ore came out with the concepts of 'domination number' and 'dominating graph' for the first time in the year 1962. This study was further carried out by E.J.Cockayne and S.T.Hedetniemi in 1977, who have conducted a very broad survey on the resultant outcomes regarding the then existing concepts pertaining to the dominant graphs. The pair first applied the notation $\gamma(G)$ pertaining to the domination number of a graph, which was universally accepted ever since. This theory of domination in graphs as advocated by Ore and Berge is an un trodden ground for the researchers till very recently.

II. PRELIMINARIES

The number of edges incident with a vertex V is called degree of V and is denoted by $d(v)$. Let $G = (V, E)$ be a graph, a set $D \subseteq V$ is a dominating set of G if every vertex in $V \setminus D$ is adjacent to some vertex in D . The domination number $\gamma(G)$ of G is the minimum cardinality of a dominating set. A dominating set with minimum

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This paper analyze the Magneto hydrodynamic, Radiation, chemical reaction, heat source and solet effects on unsteady flow, heat and mass transfer characteristics in a viscous, in compressible and electrically conduction fluid over a semi-infinite vertical porous plate through porous media. The porous plate is subjected to a transverse variable suction velocity. The transient, non-linear and coupled governing equations have been solved adopting a perturbative series expansion about a small parameter, ϵ . The effects of governing parameters on the flow variables are discussed graphically.

1. INTRODUCTION

The study of magneto hydrodynamics (MHD) plays an important role in agriculture, engineering and petroleum industries. MHD has won practical applications, for instance, it may be used to deal with problems such as cooling of nuclear reactors by liquid sodium and induction flow water which depends on the potential difference in the fluid direction perpendicular to the motion and goes to the magnetic field and also study of MHD of viscous conducting fluids is playing a significant role, owing to its practical interest and abundant applications, in astro-physical and geo-physical phenomenon. Astro-Physicists and geo-physicists realized the importance of MHD in stellar and planetary processes. The main impetus to the engineering approach to the electromagnetic fluid interaction studies has come from the concept of the magneto hydro dynamics, direct conversion generator, ion propulsion study of flow problems of electrically conducting fluid, particularly of ionized gases is currently receiving considerable interest. Such studies have made for years in convection with astro-physical and geo-physical problems such as Sun spot theory, motion of the interstellar gas etc. Recently, some engineering problems need the studies of the flow of an electrically conducting fluid, in ionized gas is called plasma. Many names have been used in referring to the study of plasma phenomena.

The MHD generation process is based on Faraday's electro-magnetic induction law. So Magneto-hydrodynamic generator generates thermal energy or kinetic energy of a moving conducting fluid into directly electrical energy. Examples of such kind of fluids are ionized gas, plasma, liquid metals, and seawater. It's a plasma technology. The gas is continuously seeded with potassium nitrate, making the gas electrically conductive at lower temperatures. The alkali metal ionizes easily at lower temperatures. MHD generators are different from conventional electric generators in that they can operate at high temperatures without moving parts.

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NUMERICAL STUDY OF NATURAL CONVECTION IN A SQUARE CAVITY WITH MAGNETIC FIELD AND SEMI CIRCULAR HEAT SOURCE OF DIFFERENT ORIENTATIONS

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INTRODUCTION

Free convection in cavity has received considerable attention from researchers. Most of the cavities commonly used in industries are circular, square, rectangular, trapezoidal and triangular etc. Square cavities have received a considerable attention for its application in various fields. Taghikhani and Chavoshi [1] numerically investigated two dimensional magneto hydrodynamics (MHD) free convection with internal heating in a square cavity. They observed that the effect of the magnetic field is to reduce the convective heat transfer inside the cavity. Bakhshan and Ashoori [2] investigated numerically analysis of a fluid behavior in a rectangular enclosure under the effect of magnetic field. They observed that Nusselt number rises with increasing Grashof and Prandtl numbers and decreasing Hartmann and orientation of magnetic field. Öztop and Al-Salem [3] numerically investigated effects of joule heating on MHD natural convection in non-isothermally heated enclosure. They observed that positive stream functions are decreased with increasing of Hartmann number and thermal boundary layer becomes larger. Parvin and Nasrin [4] investigated numerically analysis of the flow and heat transfer characteristics for MHD free convection in an enclosure with a heated obstacle. They found that buoyancy-induced vortex in the streamlines is increased and thermal layer near the heated surface becomes thick with increasing Rayleigh number. Natural convection in a square cavity localized heating from below was investigated by Santosh et al. [5]. They observed that heat transfer increases when the heater source is placed towards the cold wall. In the light of the above literatures, the present study addresses the effects of MHD free convection on heat flow within a square cavity. Free convection flow in the presence of magnetic field in a square cavity with semi circular heat source was



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Anatomical features of *Gynura lycopersicifolia* DC.

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Abstract: The present paper deals with anatomical features of *Gynura lycopersicifolia*, a rare medicinal plant collected from Tirumala hills of Andhra Pradesh. Photographs of Habitat, live specimen, dried plant parts, stem and Transverse sections (T.S) and internal anatomy with cell measurements of Leaf, Stem and Root were provided for easy identification and authentication of the species were provided with note on diagnostic characters.

Keywords: *Gynura lycopersicifolia*; Anatomical features; Tirumala hills.

Introduction

In pursuance of Pharmacognostical and ethno-botanical studies on some important medicinal plants in Chittoor district of Andhra Pradesh in India, it was found that some important medicinal plants were under studied and misidentified (Pushpalatha and Sujathamma, 2019). *Gynura lycopersicifolia* (Asteraceae), a rare succulent erect herb, a medicinal valued plant species is one among misidentified and adulterated with diverse impediments. It was established that anatomical characters can impeded the identification when morphological features are indistinct (David *et al.*, 2008). Some researchers (Kavitha *et al.*, 2019; Jyothi *et al.*, 2015; Prathap *et al.*, 2012 & 2014; Ramesh and chetty *et al.*, 2014) studied anatomical studies on medicinal plants of Tirumala and revealed the taxonomic ambiguity with anatomical studies.

Gynura lycopersicifolia DC., Prodr. [A. P. de Candolle] 6: 300 (1838). (Figure.1.A - C)

Vernacular names are Adavitametaaku and Needa chamanthi and the flowering and fruiting occurs between December - March.

Perusal of literature revealed that, Pullaiah and Ramamurthy (2007) reported this species occurrence from Tirumala and Vishkapatanam associated areas. Chetty *et al.*, (2018) reported it from Ghat roads, Papavinasanam, Japali hanuman teertham areas in Tirumala of Andhra Pradesh.

In this present research, we intended to work on anatomical features of *Gynura lycopersicifolia* which should be considered as rare species. This investigation aims to improve the existing data for identification in the typical *Gynura* species and this forms the additional feature.

Materials and Methods

The specimens of *Gynura lycopersicifolia* were collected from the rocky crevices in foot path waysides from Akasaganga theertham to Papavinasanam in of Tirumala in Andhra Pradesh (Figure 1.A - D). The botanical identification of the taxa was carried out by using regional and local floras (Hooker, 1982; Gamble and Fischer, 1957; Pullaiah and Sri Ramamurthy., 2007 and Chetty *et al.*, 2018). The herbarium was prepared according to the method of Jain and Rao (1977) and deposited in the Herbarium of Department of Botany, Sri Venkateswara University, Tirupati, Andhra Pradesh for further use. The voucher specimens (SVUTY/AST/3174) were authenticated by comparing voucher herbarium specimens deposited at BSI, Southern circle, Coimbatore (MH), Tamil Nadu.

Anatomical study- Microtomy

Healthy whole plant (leaf, petiole, stem, root) in vegetative stage were chopped and fixed in the field immediately in FAA (Formalin - 5ml + Acetic acid - 5ml + 70% ethyl alcohol - 90 ml).

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<http://dx.doi.org/10.21746/aps.2020.9.7.2>

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Antibacterial activity of four ethnobotanical drugs of Rayalaseema, Andhra Pradesh, India.

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Abstract: The study aimed to evaluate the antibacterial activity by crude aqueous extract of ethnobotanical drugs prepared and prescribed by ethnic healers of Rayalaseema region. Ethnic drugs prepared from whole plant parts of *Litsea deccanensis* (LD), *Atalantia racemosa* (AR), *Hiptage benghalensis* (HB) and *Lagerstroemia parviflora* (LP) at dosages of 25, 50, 75 mg/mL were tested against pathogenic bacteria (*Bacillus subtilis*, *Staphylococcus aureus*, *Escherichia coli* and *Klebsiella pneumonia*) using agar well diffusion technique. Results reported significant antibacterial effect at 50 & 75 mg/mL for all the drugs tested and recommend these crude drugs as antibacterial agents.

Keywords: Ethnobotanical drugs; Rayalaseema; Antibacterial activity.

Introduction

The existing antimicrobial agents depriving its potency and efficacy against new microbial evolution and resistance resulting need to optimize microbial infestations and its control by developing novel antimicrobial agents (Balouiri *et al.*, 2016; Mostafa *et al.*, 2018; Boakye *et al.*, 2019). The mining of novel antimicrobial agents from traditional medicinal plants is critically needed due to the surge in antimicrobial resistance in global health concerns and there is a vital need to replenish our arsenal of antimicrobial agents. Plant derived formulations proved to be historical pharmacopoeias with potential therapeutic properties with ample diversity of metabolites which act as antimicrobial agents (Valgas *et al.*, 2007; Sinha *et al.*, 2013; Dubey *et al.*, 2018; Elhedar *et al.*, 2019). In the vision of ethnic healing commodities, there are plenty of ethnic drugs prepared from the locally available plants setting up by varied formulation, dosage and citing precautions.

Research concerning the biological efficiency of whole plant crude drugs proposed by ethnic healers of rayalaseema were scarce which made to take up this investigation. Studies on the ethnobotanical crude drugs which were prepared from whole plant parts are not properly documented.

In the present paper, we have attempted to scientifically validate the ethnic antibiotic plant crude drugs prescribed and recommended by ethnic healers of Rayalaseema region of Andhra Pradesh.

Materials and Methods

Ethnobotanical exploration in Rayalaseema revealed few commonly used crude ethnobotanical drugs prescribed for different microbial infestations and for wounds. Data on ethnic plant drugs and its dosage, composition, applied conditions in intake were collected from different ethnobotanical healers and village

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<http://dx.doi.org/10.21746/aps.2020.9.3.6>

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IJCRT.ORG**ISSN : 2320-2882****INTERNATIONAL JOURNAL OF CREATIVE
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SAVINGS BEHAVIOUR AND INVESTMENT PREFERENCES IN RURAL HOUSEHOLDS IN KURNOOL DISTRICT : AN EMPIRICAL STUDY

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ABSTRACT

The capital market is an important constituent of the financial system. It is the market both debt and equity for long term funds. Generally, it is mainly deals with financial assets, excluding currency. The financial assets comprises shares, mutual funds, bonds, pension funds, fixed deposits, insurance policies, provident fund and derivatives. The Indian Stock Exchanges are well regulated, functioning smoothly and it is the indication of healthy capital market. The financial markets and financial institutions are two mechanisms of channel from savings to investment. The financial market score over financial institutions in the allocation efficiency, as they allocate savings to those investments, which have potential to yield higher returns. This inevitably leads to higher returns to savers on their savings and higher productivity on investments to enterprises. Investment culture refers to the attitudes, perceptions, and willingness of the individuals and institutions in placing their savings in various financial assets, more popularly known as securities. A study on savings behavior and Investment preferences of individual investors which includes the investors' perceptions and preferences. It assumes a most significance in the formulation of policies for the development and regulation of security markets. This study only confines to Kurnool district in Andhra Pradesh and 300 samples were selected who are living in rural areas. In this context, the researcher has collected data on their behavior, awareness of saving and investment pattern in selected study area.

Key words: Capital market, Savings behavior, Investment

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BENEFICIAL EFFECT OF *ALOE VERA* GEL AND *MANGO* PULP ON STREPTOZOTOCIN-INDUCED DIABETIC RATS AND ITS REGULATION ON OXIDATIVE ENZYMES OF HEART AND KIDNEY

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Abstract:

Natural dietary supplements are essential for the treatment of Diabetes mellitus and its complications. So in our study we focused on combined effect of *Aloe vera* gel and Mango pulp on oxidative enzymes of heart and kidney of rat. In the present work eight groups of rats were taken Group – I, II and III were treated as control rats, Group – IV, V, VI, VII and VIII as experimental groups. As the oxidative enzymes play a key role in carbohydrate metabolism pathway and it is expected changes in citric acid cycle during diabetes. Hence it is essential to understand the function of some of the important marker enzymes and to find out their correlation with dietary supplements and diabetes. An attempt has been made in the present study to analyze the activity of dehydrogenase enzymes like MDH, SDH and LDH in both control and experimental rat kidney and heart tissues, as they exhibit important role in ATP production and in electron transport system also. The result reveals that MDH and SDH activities were decreased in Diabetes induced group and in contrast the LDH was increased. On treatment with *Aloe vera* gel and Mango pulps individually and in combination of both the alterations in the oxidative enzymes of heart and kidney were reestablished. Thus from these findings, it is possible to recommend natural dietary supplements such as mango pulp and *Aloe vera* gel for control of sugars in diabetic patients without any side effects.

Key words:

Diabetes mellitus, *Aloe vera*, Mango pulp, Dehydrogenase enzymes and Natural dietary supplements.

1. INTRODUCTION:

Diabetes mellitus is most common and epidemic in nature, the report of International Diabetes Federation (IDF) stated that in year 2019 around 463 million people were diagnosed with diabetes across the world and it is estimated that this number may rise to 700 million by 2045 (PouyaSaeedi et al., 2019, Eleftheria Papachristoforou et al., 2020). It is categorized in heterogeneous group of action or both (Zubin Punthakee et al., 2018). Alterations in the carbohydrate, protein and fat metabolisms are related to insulin secretions in general which play a vital role in energy production, (Radha Madhavi et al., 2012). All mitochondrial enzymes

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ADVANTAGES AND DISADVANTAGES OF GREEN TECHNOLOGY: A STUDY

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Abstract:

The concept of green process and technologies is the processes and technologies which are environmentally friendly and clean technology. The goals of green technologies are as follow which are to meet the needs of society in the way without depleting or damaging natural resources on earth which is the major target of green technologies. The concept is to make products which can be fully reclaimed or reused. Furthermore, by changing patterns of production and consumption, steps are being taken into account to diminish waste and pollution as one of the most indispensable aims of green technologies. Many companies have committed for establishing manufacturing practices and business regarding green technologies. Besides, this kind of technology implies to a system which utilizes innovative techniques to create environmental friendly products. Predominantly, it contains the various everyday cleaning products, waste, inventions, energy sources, clothing and host of others. Going green or using technologies which are environmental friendly is amongst the many methods which countries are looking in order to spur economic growth and develop the lives of its citizens. Green processes and technologies use renewable and natural resources which never depletes. Besides, green technology utilizes innovative and new techniques in terms of energy generation.

KeyWords: Green Technology, Pollution, Wastemanagement, recycling methods.

I. INTRODUCTION

1.1 Advantages of Green Processes and Technology

Slow the impacts of global warming by reducing CO₂ emissions The advantage of using green energy sources is that it must be clean therefore there is no discharge or damage into the environment or atmosphere. Besides, it is also replenishable in contrast to oil. In addition, green energy facilities are difficult on the pocketbook to build, it demands a lesser amount of upkeep thus it lacks to spend some huge cash to work it. Moreover, this

MULTIPLICATIVE (GENERALIZED (α, β) - DERIVATIONS ACTING AS HOMOMORPHISM AND ANTI-HOMOMORPHISM IN PRIME RINGS

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Abstract : Let R be a prime ring. Suppose that α, β are automorphisms of R . A mapping $F : R \rightarrow R$ is called a multiplicative (generalized) (α, β) -derivation if there exists a map $d : R \rightarrow R$ such that $F(xy) = F(x)\alpha(y) + \beta(x)d(y)$, for all $x, y \in R$. A non zero Jordan ideal of R . The main result of the present paper states that if F is a multiplicative (generalized) (α, β) -derivation on J which also acts as a homomorphism or as anti-homomorphism on J , then either $d = 0$ or $J \subseteq Z(R)$.

Keywords : Prime rings, Jordan ideals, Multiplicative (generalized) (α, β) -derivations, homomorphism, Anti-Homomorphism.

1. INTRODUCTION

Throughout the present paper, R will denote an associative ring with center $Z(R)$. For any $x, y \in R$, the symbol (x, y) stands for all commutator $xy - yx$, while the symbol xoy will stand for the anti-commutator $xy + yx$. R is 2-torsion free if whenever $2x = 0$, with $x \in R$ implies $x = 0$. A ring R is said to be prime if for any $x, y \in R$, $xRy = 0$ implies that either $x = 0$ or $y = 0$. An additive subgroup J of R is said to be a Jordan ideal of R if $xoy \in J$ for all $x \in R$ and $y \in J$. An additive mapping $d : R \rightarrow R$ is called a derivation if $d(xy) = d(x)y + xd(y)$, holds for all $x, y \in R$. The generalized derivation of R is an additive mapping $F : R \rightarrow R$ such that $F(xy) = F(x)y + xd(y)$ for all $x, y \in R$, where d is a derivation of R . If $d = 0$ then we have $F(xy)y$ for all $x, y \in R$, which is called a left multiplier mapping of R . Thus generalized derivation generalizes both the concept of derivations as well as left multiplier mappings of R . Let S be a non empty subset of ring R , the mapping $F : R \rightarrow R$ is said to be a homomorphism (anti-homomorphism) acting on S if $F(xy) = F(x)F(y)$ holds for all $x, y \in S$ (respectively, $F(xy) = F(y)F(x)$ holds for all $x, y \in S$).

A multiplicative derivation of R is a mapping $d : R \rightarrow R$ which satisfied $d(xy) = d(x)y + xd(y)$ for all $x, y \in R$. Ofcourse these mapping are not additive. The concept of multiplicative derivations was introduced by Dai[4]. Further, the complete description of those maps was given by Goldmann and Semrl in[8]. The notion of multiplicative derivation was extended to multiplicative generalized derivation in[7]. A mapping $F : R \rightarrow R$ is called a derivation d such that $F(xy) = F(x)y + xd(y)$ for all $x, y \in R$. In this definition, if we consider d is any map on R (not necessarily additive) then it is called as a multiplicative (generalized)-derivation if $F(xy) = F(x)y + xd(y)$ for all $x, y \in R$, where d is any mapping on R (not necessarily a derivation not an additive map). Hence the concept of multiplicative (generalized) derivation covers the concept of multiplicative (generalized)-derivation with $d=0$ covers the concept of multiplicative centralizers (not necessarily zero). Obviously, every generalized derivation is multiplicative (generalized)-derivation on R . However, the converse is not true in general.

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Generalized Skew Reverse Derivations in Semi Prime Rings

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Abstract : The study of generalized skew reverse derivations in semiprime and prime rings. In section 1 we study different situations for a semi prime ring to be commutative by admitting generalized skew reverse derivations, several authors proved commutative property by admitting reverse derivations, generalized reverse derivations in semi prime rings and prime rings. In this line of investigation we extend the results of Ali et al [2] where they studied the results on lie ideals with multiplicative derivations in prime and semiprime rings to semi prime rings admitting generalized skew reverse derivations. In this paper, we extend the results of Chirag Garg and Sharma [9], where they studied on some identities by admitting generalized (α, β) derivations on a non zero square closed Lie Ideals of a prime ring to generalized skew reverse derivations on Ideals in prime rings.

Keywords : Prime rings, Generalized skew reverse derivations, semiprime rings, skew reverse derivations.

1. INTRODUCTION

Throughout, R denotes a ring with center $Z(R)$. We write $[x, y]$ for $xy - yx$. Recall that a ring R is called *prime* if $aRb = 0$ implies $a = 0$ or $b = 0$; and it is called *semiprime* if $aRa = 0$ implies $a = 0$. A prime ring is obviously semiprime. An additive mapping d from R into itself is called a *derivation* if $d(xy) = d(x)y + xd(y)$, for all $x, y \in R$. a mapping f from R into itself is *commuting* if $[f(x), x] = 0$, and *skew commuting* if $f(x)x + xf(x) = 0$, for all $x \in R$. A considerable amount of work has been done on derivations and related maps during the last decades (see. eg., (Beidar et al[4], Bell and Martindale[5], Bresar[6]) and references therein). Bresar and Vukman [7]) have introduced the notion of a *reverse derivation* as an additive mapping d from a ring R into itself satisfying $d(xy) = d(y)x + yd(x)$. for all $x, y \in R$. Obviously, if R is commutative, then both derivation and reverse derivation are the same. In the present note, we explore more about reverse derivations. We will show that while the notions of derivation and reverse derivation do not coincide, the set of all derivations and the



On Ideals and Multiplicative (Generalized) - (Φ, Φ) - Derivations

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Abstract: Let P be a prime ring. I is a nonzero ideal of P . Φ is an automorphism on P . A mapping $M : P \rightarrow P$ is called Multiplicative (generalized) (Φ, Φ) -derivation if there exist a map $d : P \rightarrow P$ such that $M(a, b) = M(a)\Phi(b) + \Phi(a)d(b)$ holds for all $a, b \in P$. The objective of the present paper is to study the following identities (i). If $M(ab) + M(a)M(b) = 0$ for all $a, b \in I$ then $\Phi(I)[M(a), M(b)] = 0$ for all $a \in I$ (ii). Let M_1 and M_2 be two multiplicative (generalized)- (Φ, Φ) derivations on P associated with the maps d_1 and d_2 on P respectively. If $M_1(ab) = \Phi(b) \circ M_2(a)$ for all $a, b \in I$ then R is abelian or commutative or $\Phi(I)[\Phi(I), M_2(I)] = 0$ (iii). If $M_1(ab) = [\Phi(b), M_2(a)]$ for all $a, b \in I$ then either $\Phi(I)[\Phi(I), M_2(I)] = (0)$ or R is commutative.

MSC: 16W25, 16N60, 16U80.

Keywords: Primring, Ideal, Multiplicative (generalized) derivation, Multiplicative (generalized)- (Φ, Φ) -derivation.

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1. Introduction

A ring P is prime if for any $a, b \in P$, $aPb = (0)$ implies that either $a = 0$ or $b = 0$. $M(a, b) = M(a)\Phi(b) + \Phi(a)d(b)$ for all $a, b \in P$ is called Multiplicative (generalized) (Φ, Φ) -derivation, where $M : P \rightarrow P$ is a mapping and P is a prime ring. In 2014 [1] Dhara proved few identities connected to Multiplicative (generalized) (σ, σ) derivations where σ is an epimorphism. Furthermore accurately they demonstrated succeeding outcomes. Let R be a semi prime ring, I a nonzero left ideal of R and σ any epimorphism of R Suppose that F is a Multiplicative (generalized) (σ, σ) derivation associate with the map d . If $F(xy) - F(x)F(y) = 0$ holds for all $x, y \in I$ then $\sigma(I)d(I) = (0)$ and $\sigma(I)[F(x), \sigma(x)] = (0)$ for all $x \in I$. In 2020 [2] chirag Garg showed few results associated to Left ideals and Multiplicative (generalized) (α, β) -derivations. Particularly, they proved the subsequent result. Let R be a prime ring and L be a non zero left ideal of R . Suppose that F is Multiplicative (generalized) (α, β) -derivation on R associated with the map d on R . If $F(xy) + F(x)F(y) = 0$ for all $x, y \in L$ then either $\sigma(L)[F(x), \alpha(x)] = (0)$ or $\beta(L)[F(x), \beta(x)] = (0)$ for all $x \in L$. Considering exceeding results we initiate our theorems We will frequently use the basic commutator and Skew-commutator identities

- (i). $[xy, z] = x[y, z] + [x, z]y$.
- (ii). $[x, yz] = y[x, z] + [x, y]z$.
- (iii). $x \circ yz = (x \circ y) - y[x, z] = y(x \circ z) + [x, y]z$.
- (iv). $xy \circ z = x(y \circ z) - [x, z]y = (x \circ z)y + x[y, z]$ for all $x, y \in P$.

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ON GENERALIZED LEFT DERIVATIONS AS HOMOMORPHISONS AND ANTI - HOMOMORPHISMS

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Abstract

Let R be a 2-torsion free prime ring and $I \neq 0$ an Ideal of R and F is a generalized left derivation of R . In this paper we study the following conditions such that either $F(xy) = F(x)F(y)$ or $F(xy) = F(y)F(x)$ for all $xy \in I$, then R is commutative.

1. Introduction

Throughout the present paper R will denote an associative ring with center $Z(R)$. For any $x, y \in R$ the symbol $[x, y]$ stands for the commutator $xy - yx$ the symbol (x, y) stands for the anti commutator $xy + yx$, thus the commutator identities.

$$(i) [xy, z] = x[y, z] + [x, z]y$$

$$(ii) [x, yz] = y[x, z] + [x, y]z \text{ for all } x, y, z \in R.$$

Key Words : *Left derivations, Generalized left derivations.*

2010 AMS Subject Classification : 16W25, 16N60, 16U80.

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MULTIPLICATIVE (GENERALIZED (α, β) – DERIVATIONS ACTING AS HOMOMORPHISM AND ANTI-HOMOMORPHISM IN PRIME RINGS

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Abstract : Let R be a prime ring. Suppose that α, β are automorphisms of R . A mapping $F : R \rightarrow R$ is called a multiplicative (generalized) (α, β) – derivation if there exists a map $d : R \rightarrow R$ such that $F(xy) = F(x)\alpha(y) + \beta(x)d(y)$, for all $x, y \in R$. A non zero Jordan Ideal of R . The main result of the present paper states that if F is a multiplicative (generalized) (α, β) -derivation on J which also acts as a homomorphism or as anti-homomorphism on J , they either $d = 0$ or $J \subseteq Z(R)$.

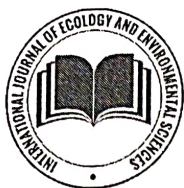
Keywords : Prime rings, Jordan ideals, Multiplicative (generalized) (α, β) -derivations, homomorphism, Anti-Homomorphism.

1. INTRODUCTION

Throughout the present paper, R will denote an associative ring with center $Z(R)$. For any $x, y \in R$, the symbol (x, y) stands for all commutator $xy - yx$, while the symbol xoy will stand for the anti-commutator $xy + yx$. R is 2-torsion free if whenever $2x = 0$, with $x \in R$ implies $x = 0$. A ring R is said to be prime if for any $x, y \in R$, $xRy = 0$ implies that either $x=0$ or $y = 0$. An additive subgroup J of R is said to be a Jordan ideal of R if $xoy \in J$ for all $x \in R$ and $x \in J$. An additive mapping $d : R \rightarrow R$ is called a derivation if $d(xy) = d(x)y + xd(y)$, holds for all $x, y \in R$. The generalized derivation of R is an additive mapping $F : R \rightarrow R$ such that $F(xy) = F(x)y + xd(y)$ for all $x, y \in R$, where d is a derivation of R . If $d = 0$ then we have $F(xy) = F(x)y$ for all $x, y \in R$, which is called a left multiplier mapping of R . thus generalized derivation generalizes both the concept of derivations as well as left multiplier mappings of R . Let S be a non empty subset of ring R . the mapping $F : R \rightarrow R$ is said to be a homomorphism (anti-homomorphism) acting on S if $F(xy) = F(x)F(y)$ holds for all $x, y \in S$ (respectively, $F(xy) = F(y)F(x)$ holds for all $x, y \in S$).

A multiplicative derivation of R is a mapping $d : R \rightarrow R$ which satisfied $d(xy) = d(x)y + xd(y)$ for all $x, y \in R$. Ofcourse these mapping are not additive. The concept of multiplicative derivations was introduced by Daif[4]. Further, the complete description of those maps was given by Goldmann and Semrl in[8]. The notion of multiplicative derivation was extended to multiplicative generalized derivation in[7]. A mapping $F : R \rightarrow R$ is called a derivation d such that $F(xy) = F(x)y + xd(y)$ for all $x, y \in R$. In this definition, if we consider d is any map on R (not necessarily additive) then it is called as a multiplicative (generalized)-derivation if $F(xy) = F(x)y + xd(y)$ for all $x, y \in R$, where d is any mapping on R (not necessarily a derivation not an additive map). Hence the concept of multiplicative (generalized) derivation covers the concept of multiplicative (generalized)-derivation with $d=0$ covers the concept of multiplicative centralizers (not necessarily zero). Obviously, every generalized derivation is multiplicative (generalized)-derivation on R . However, the converse is not true in general.





Inventory of invasive alien plant taxa in gundla brahmeswaram wildlife sanctuary, Nallamalais, India: Implications for monitoring and management

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Abstract

Gundla Brahmeswaram wildlife sanctuary is invaded by many alien plant taxa which interfere with native biodiversity. It is highly important to explore the concerned problems caused by the intrusion of invasive plant taxa and to mitigate the impact on native diversity. To achieve this, the present study has taken up for the first of its kind and listed the 102 plant species representing 84 genera and 32 families. Of these, 54 plant species have their origin in Tropical America followed by many other parts of the world. The predominant family was Asteraceae with 23 plant species, followed by Fabaceae (12), Amaranthaceae (10), Convolvulaceae (7), Malvaceae (6), Euphorbiaceae, Lamiaceae, Solanaceae (4 each), Acanthaceae, Poaceae (3 each), Apocynaceae, Asparagaceae, Cleomaceae and Cuscutaceae (2 each). 18 families were contributed with single species each. The abundant and most serious invasive species were recognized in the sanctuary, namely, *Hyptis suaveolens*, *Lantana camara*, *Senna uniflora*, *Parthenium hysterophorus*, *Ageratum conyzoides*, *Waltheria indica*, *Chromolaena odorata*, *Mimosa pudica* and *Prosopis juliflora*, *Cuscuta* species. The present study calls for a standard, unique planning in early identification, spreading and infestation of invasive weeds and involve taxonomists, forest managers, ecologists to control and monitor.

Keywords: invasion - native diversity - monitor - control - management- wildlife sanctuary

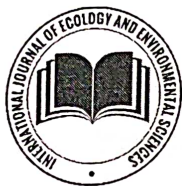
Introduction

Invasive species are non-native which have the potential to threaten many aspects such as environment, health and even economy. These are 'the second worst threat to native diversity in the planet earth' after habitat destruction (CBD 1992)^[4], and they are severe threat to native biodiversity, habitat destruction and the greatest component of global climatic change (Khuroo *et al.* 2007, Pasha *et al.* 2014)^[17, 26]. Alien species are recognized as of casual, naturalized and invasives (Richardson *et al.* 2000)^[39]. The introduction of plants to a new place is an age old practice to human kind during migration and is enormously influenced by various factors such as cultural background, political history, extent of trade, etc. (Rhuiller *et al.* 2005, Bomford 2009, Reshi and Khuroo 2012)^[2, 40, 38] and accidentally or intentionally happened through the crop seeds, or imported biota (Pimentel *et al.* 2000)^[28]. The introduction and spread of non-native species can significantly alter the ecological functions of forest ecosystem and the primary productivity of plant taxa in time and space (Shah *et al.* 2012)^[40]. Many indigenous species are threatened by competition and predation from invaders, while many other species are endangered by hybridization and ecosystem changes caused by alien species (Pimentel *et al.* 2005)^[29]. Over 40% of the species on the list of threatened and endangered species are due to the invasive species only (Wilcove *et al.* 1998)^[51]. Majority of the alien introduced species escape from cultivation, spread slowly and silently at initial stage, but

become dominant and widespread at later stages to attain an invasive status in the introduced range and prove detrimental for the native biodiversity (Khuroo *et al.* 2008, 2010)^[18, 16]. A large number of plants that are using today either for food, plantation or for ornamental purpose were deliberate introductions during post Columbian period, especially from tropical America (Purseglove 1969, Simmonds 1976, Ferra 1994)^[31, 44, 9]. Invasive alien species (IAS) cause major environmental and economic problems in agriculture, forestry, and several other segments of the world economy; adversely affect ecosystem structure and function in habitats through the world by reducing native species, changing soil nutrient status, and altering geomorphological process (Pimentel *et al.* 2000, Mandal and Joshi 2014)^[28, 21]. It is estimated that in India alien species are causing 30% loss in potential crop production worth about US\$ 90 billion per year (Kohli and Batish 1996)^[19]. Native biodiversity have revealed that both the structural organization and the functional integrity of ecosystems are affected due to invasion by alien species. There is a growing catalogue of the potential impacts of invasive species on native species, wildlife habitats, disturbance regimes, and ecosystem services (Hiremath and Sundaram 2013, Simberloff *et al.* 2013, Foxcroft *et al.* 2014)^[14, 43, 10] in worldwide. IAS not only pose a serious threat to native biodiversity but also influence serious consequences for the ecology, economy, public health and biosecurity of the countries involved (Pejchar and Mooney

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Introduction

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Exploring Structural, Morphological, and Magnetic Properties of Zinc Nickel Ferrites Systems Nanocomposites

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Received: 26.05.2020; Revised: 1.07.2020; Accepted: 2.07.2020; Published: 4.07.2020

Abstract: The formation of Zinc Nickel Ferrites Systems Nanocomposites (ZNFONCs) through Ethylene glycol (PEG) surfactant was achieved by chemical co-precipitation technique. Their structure, shape, and constituents were investigated by X-ray diffraction, dispersion, and scanning electron microscopy. The photocatalyst effect of Zinc-Nickel ferrite system Nanocomposites was determined by methyl Blue (MB), when exposed to ultraviolet light. Magnetization estimation by vibrating magnetometer at room temperature is an additional effort in the present work.

Keywords: Zinc nickel ferrite system; Chemical synthesis; Microstructure; Magnetic estimations.

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1. Introduction

Nanocomposites have earned sufficient attraction among materials, due to their nanocrystal properties which purely rely on their composition and dimension [1-5]. Photocatalytic activity on semiconductors has aroused interest because the technique is one of the most reliable and effective means for the disposal of organic impurities [6-8]. Due to the high probability of altering their attributes through cation splitting or atomic replacement into the tetrahedral or octahedral region, Cubic ferrite nanoparticles have a wide application [9-11]. Their formula is $M^{2+}Fe_2^{3+}O_4^{2-}$, where M can be Co^{2+} , Zn^{2+} , Ni^{2+} . Apart from spin-filtering [12] and multiferroic devices [13-14], Identification, diagnosis, and solution have been disclosed in biomedicine. Magnetic nanoparticles have enhanced potential because of its ample application in data gathering, diagnostics, Ferrofluid dynamics, etc., [15-18]. This is significant because the characteristics of nanoparticles are distinct from their parental sample [19]. Zinc substituted ferrites (Ni-Zn) are found to be sensitive to temperature. Ferrofluids formed by these ferrites are excellent material, in heat exchangers by converting magnetic into caloric energy [20-22].

Influence of Gd^{+3} Cation Substitution on the Functional Properties of $Al_{0.8}La_{0.2}TiO_3$ Nanoparticles

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Abstract:- In present, the work reports on the effect of Gd-substitution on Aluminum Lanthanum Titanate (ALT) perovskite structures, structural and optical properties. The $Al_{0.8}Gd_yLa_{0.2-y}TiO_3$ ($y = 0.01, 0.02, 0.03, 0.04$) (AGLTO) hydrothermally synthesized nanoparticles. The XRD indicates crystallite size, Micro-strain, dislocation density and FWHM (full-width half maxima). The Scherer's formula and Williamson-Hall (W-H) analysis used the X-ray peak expansion technique to determine the crystalline sizes and lattice strain; it was observed that an inversely proportional relationship exists. Fourier transforms infrared spectra (FT-IR) tested the presence of Al-O, Gd-O, La-O & Ti-O based metal oxide (M-O) bonds at A & B sites. The E_g values are increased from 3.293 to 3.372 eV with increase of Gd content from $y = 0.01$ to 0.04 contents show the wide E_g values suggesting optoelectronic and sensor applications.

1. INTRODUCTION

The perovskite titanates doped with rare earth components offered fascinating structural, morphological, electrical, dielectric, magnetic, magneto-caloric and piezoelectric, etc., properties [1]. Numerous researchers focused on different properties of notable perovskite titanates like $MTiO_3$ ($M = Ba, Ni, Mg, Sr, Pb, Al, La, Ca, Zn, Mn, Co, Eu, Zr$ and so forth,) [1]. Among these titanates, the aluminum titanates (AT) were concentrated in an exceptionally restricted way. Aluminum titanate perovskites were concentrated by past researchers [2-6] for primary, optical, photocatalytic, electrical and mechanical properties.

Specifically, Sahu et al. [2], arranged the AT nanoparticles and detailed the tetragonal design and dielectric properties. Azarniya et al. [3], fostered the AT nanoparticles just as nanofibers. Further, the inside and out microstructure was explored. Bakhshandeh et al [4], detailed the photocatalytic action of AT nanoparticles. Ewais et al. [5], separated the AT based earthenware production from the aluminum sludge waste. Tang et al. [6], noticed the goliath electro rheological impacts in AT nanoparticles. From this review, unmistakably the writing on AT and its based nanomaterials was not accessible in a bountiful way. To expand the dielectric steady of $Al_{0.8}La_{0.2}TiO_3$, we wanted to substitute the Gd-rare earth component. Consequently, the $Al_{0.8}Gd_yLa_{0.2-y}TiO_3$ ($y = 0.01 - 0.04$)/AGLTO nanoparticles were arranged through aqueous strategy, wherein a few benefits like low working temperatures, less force and tedious, great crystallinity,

simple example planning, and modest were accomplished [7].

2. EXPERIMENTAL PART

To set up the AGLTO nanoparticles, the trailblazer materials like $La(NO_3)_3 \cdot 6H_2O$ (99.8% temperance, Sigma-Aldrich), $Al(NO_3)_3 \cdot 9H_2O$ (99.8% flawlessness, Sigma-Aldrich), $Gd(NO_3)_3 \cdot 6H_2O$ (99.9% faultlessness, Sigma-Aldrich), and TiO_2 (99.9% temperance, Sigma-Aldrich) were taken into another glass container containing refined water as per the stoichiometric extent. With the help of appealing stirrer, the forerunner mix was blended at a consistent blending speed of 420 rpm. After some time, the white and blended nitrate game plan was outlined. Finally, they got course of action was moved to another Teflon bowl of 300 ml limit. Thusly, the Teflon bowl containing the game plan was brought into the solidified steel autoclave. By then, to play out the watery reaction, the autoclave was kept inside the hot air oven for 8 h at $150^\circ C$. Besides, the autoclave was chilled off to room temperature followed by the ejection of tests from the Teflon bowl. Accordingly, they got test was cleaned for a couple of times until the pH worth of the model shows up at 7. In addition, using the hot air grill, the model was dried for 120 min at $60^\circ C$. Fittingly, they got AGLTO nanoparticles gone through different depictions, for instance, X-ray diffractometer (XRD, Bruker, $CuK\alpha$, $\lambda = 0.15406$ nm), FT-IR spectrophotometer (IR inclination 1, Shimadzu) and UV-Apparent spectrophotometer (JASCO, V-670 PC) to ponder the underlying and optical properties, separately.

3. XRD ANALYSIS

The X-ray diffraction patterns of AGLTO nanoparticles are recording as shown in Fig.1. These patterns provided multiple number of diffraction peaks indicating the polycrystalline nature. It is observed that the maximum intensity is recorded at two-theta angle 13.472° for all the samples. From the maximum intensity (I_{max}) data (see Table.1), it's find that the intensity of the maximum peak position is increased from 6155 to 11840 with increase of Gd-content in the $Al_{0.8}La_{0.2}TiO_3$ system. Therefore, it is confirmed that the substitution of Gd-element induced the crystallinity of $Al_{0.8}La_{0.2}TiO_3$. However, its notice that these peak positions are not matched with any standard structure. Herein, the peak positions of $x = 0.01 - 0.04$ contents are identifying to be

Structural and Optical Properties of ZnTiO₃ Nanoparticles Synthesized by Hydrothermal Method

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Abstract:- ZnTiO₃ is a promising wide-energy band gap semiconductor material because of its current and potential uses in catalysts, microwave insulators, luminous materials, nonlinear optics, solar cells, and gas sensors. In the present work, ZnTiO₃ nanoparticles were synthesized by hydrothermal method. The structural properties and parameters have been investigated by using X-ray diffraction (XRD). The XRD results revealed that the particle attributed high phase purity, and good crystalline. The structure of ZnTiO₃ nanoparticles found cubic spinel phase and using the Scherrer equation the average crystallite size was calculated as 31.74 nm. The X-ray peak broadening analysis was used to evaluate the crystalline sizes and lattice strain by the Williamson-Hall (W-H) analysis. The functional group information conforms to the ZnTiO₃ nanoparticles. The FE-SEM images showed the particle shape spherical with partial agglomeration. Furthermore, the optical band gap (E_g) was determined using UV-Visible spectra.

Keywords: XRD, FTIR, UV-Vis, Hydrothermal Method and Optical band gap

1. INTRODUCTION

The development of nanomaterials has been strongly pursued due to their unique features such as electronic, chemical, mechanical, magnetic, and optical properties that differ from bulk materials [1–11]. Size-dependent properties are observed such as surface plasmon resonance in some metal particles, quantum confinement in semiconductor particles, and superparamagnetism in magnetic materials. Among the different nanomaterials, perception of the behavior of ferroelectric materials at the nanoscale is important for the growth of molecular electronics. Indeed, perovskite-phase mixed-metal oxides are significant for their advantageous electrostrictive, pyroelectric, piezoelectric, electro-optic and dielectric properties with corresponding applications in the electronics industry for high-k-dielectrics, actuators, and transducers [12, 13]. Among perovskite-phase mixed-metal oxides, ZnTiO₃ has been reported to have superior electrical properties that are sufficient for applications towards microwave dielectrics [14]. Furthermore, ZnTiO₃ is an effective photocatalyst because this compound is categorized in a group of

coupled photocatalysts that can help to enhance the photocatalytic activity of TiO₂ through reducing recombination process and change band gap to enhance the optical response in the UV to the visible light range [15, 16]. Pure h- ZnTiO₃ represents superior dielectric properties in the microwave range. Many reports have been made to produce pure ZnTiO₃ powders and ceramics. But the synthesis of pure ZnTiO₃ from a mixture of ZnO and TiO₂ with a molar ratio of 1 was not successful. There are various problems with the synthesis of pure ZnTiO₃ powders by the solid-state reaction method such as large particle size, a limited degree of chemical homogeneity, high temperature, and long range of diffusion distance. In the past two decades, the sol-gel route has been successfully used for the preparation of ceramics, thin films, fibers, and glasses; this method has various advantages such as low calcination temperature, low cost, chemical homogeneity, and easy component adjustment. Besides, the sol-gel route is one of the methods for the synthesis of nanomaterials [17, 18]. Here, ZnTiO₃ nanostructures were synthesized by an unusual sol-gel method. Utilizing new and smaller number chemical materials in addition to a simple procedure is the characteristic benefit of this method in assessment to the other reports [19, 20]. In this paper, ZnTiO₃ nanoparticles were successfully synthesized by hydrothermal method. The products were characterized by various analyses such as XRD, SEM, TEM, EDS, FT-IR, and UV-Vis spectroscopy.

2. EXPERIMENTAL

To synthesize the ZT nanoparticles, the starting materials were chosen as Zn (NO₃)₂ 6H₂O and TiO₂ (each of 99.9% purity, Sigma-Aldrich). These precursors were mixed after taking their stoichiometric ratio. The whole mixed precursors were transferred to a glass beaker. Furthermore, distilled water was added to the precursors in a ratio of 1:4 (mixed precursors (gm): distilled water (ml)) and the resultant solution was kept on a magnetic stirrer. A stirring rate of 500 rpm was maintained to stir the solution. Later NaOH solution was slowly added, and the pH value reached 11. Furthermore, this solution was transferred to a 500 ml Teflon bowl



INTERNATIONAL JOURNAL OF
MULTIDISCIPLINARY RESEARCH REVIEW
(IJMDRR)
(www.ijmdrr.com)
Bangalore-560083, INDIA.

Print ISSN: 2395-1877
Online ISSN: 2395-1885
Impact Factor: 6.089

CERTIFICATE OF PUBLICATION

This is to Certify that Mr./Mrs./Ms./Dr. B. Nagendra, Dr. K Dasaratha Ramaiah has published research paper in " International Journal of Multidisciplinary Research Review (IJMDRR) peer reviewed and refereed journal, Volume- 8, Issue- 8, August 2022, pp. 31-49."

Paper Title:- " AN EMPIRICAL STUDY ON THE SOCIO-ECONOMIC CONDITIONS OF MGNREGS WORKERS IN ANDHRA PRADESH. "

Chief Editor

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Carbon stocks of scattered category of trees outside forest in Prakasam District, Andhra Pradesh, India

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Article Info

Keywords:

Carbon pool
Carbon sequestration
Trees outside forests
Plant biomass

Abstract

In the present study, carbon stocks of scattered structures of Trees outside Forest (TOF) in Prakasam district was estimated through sampling of 116 plots of size, 1 ha. Total number of individuals recorded in the sampled plots are 5014 with a mean stem density, 43.22 in a range of 18-92 per ha plot. The total biomass accounts for 3685.6 Mg. The mean carbon pool density of the sampled plots is 15.09 Mg ha⁻¹ ranges between 2.18 and 73.90 Mg ha⁻¹ and the total carbon pool for the sampled area is 1750.44 Mg.

• Received: 10 January 2022 • Revised: 24 February 2022 • Accepted: 27 February 2022 • Published Online: 6 March 2022

Introduction

Climate change is the most important global environmental challenges affecting all-natural ecosystems consequently leading to species extinctions. Unabated burning of fossil fuels over the past one century has increased the concentration of greenhouse gases especially carbon-di-oxide in the atmosphere consequently resulting in enhanced greenhouse effect, the global warming. (IPCC, 2014). The main natural carbon sinks are plants, the ocean and soil. The uptake of carbon dioxide (CO₂), during photosynthesis is the major pathway by which carbon is removed from the atmosphere and this 'capturing and securing of atmospheric carbon in the form photosynthesis and subsequently to dead organic matter is called as 'carbon

sequestration'. Vegetation in the form of forests and trees growing outside forests play a pivotal role in sequestration and trees are the largest component of aboveground biomass in terrestrial ecosystems.

Trees Outside Forests (TOF) are the trees found on neither lands that are not categorized as 'forest' nor 'other wooded land' irrespective of their patch size (FAO, 2010) and include agricultural land (including meadows and pastures), built-on land (including settlements and infrastructure) and barren land (including sand dunes and rocky outcroppings), orchards and plantations. TOF are classified into linear, scattered and block categories. Agricultural fields (field bunds), wastelands, settlements (towns/villages) are categorized under scattered category. Obligations from

తెలువారిపై నాటకాలతో సాయుధ పోరాటం చేసిన అరుదైన తెలుగువీరుడు దామరాజు పుండరీకాక్షుడు

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"The instinct of freedom is perhaps, the noblest of all human instincts, because it inspires, enlarges and elevates as well as gives meanings and content of life" అన్నది జాకీర్ హుస్సేన్ గారి మాట. (Songs of Freedom కి ముందుమాటలో) "జననీ జన్మభూమిశ్చ స్వర్గాదపీ గరీయసీ" అని రామాయణంలో చెప్పబడింది. ఇవన్నీ కూడా అక్షర సత్యమనీ చరిత్రవల్ల తెలుస్తుంది. మాతృభూమిని దాస్యశృంఖలాల నుండి విముక్తి చేయాలని ఎందరో తపాతపాలాడినట్లు దేశం కోసం ఆత్మార్పణం గావించుకున్నట్లు చరిత్ర నిరూపిస్తున్నది. ఈ పవిత్రయజ్ఞంలో కవులు, రచయితలు కూడా తమవంతు పాత్రను నిర్వహించారు. కొందరు దేశభక్తిని విషయంగా చేసుకొని కావ్యాలు రాస్తే, కొందరు స్వాతంత్ర్యవీరులను, పాలకుల దుశ్చర్యలను పద్యాలు, పాటల ద్వారా గానం చేశారు. యూరపు దేశాలలో కొందరు కవులు సాక్షాత్తుగా యుద్ధంలో స్వయంగా పాల్గొన్నారు. అవసరం వచ్చినపుడు యుద్ధం చేస్తూ అవకాశం దొరికినపుడు కావ్యాలు రాశారు. తుదకు అక్కడే ప్రాణాలు కూడా వదిలారు. విల్ ఫ్రెడ్ ఓవెన్ అనే కవి 1918 సం॥లో ఫ్రాన్సులో యుద్ధంలో పాల్గొంటూ వీరమరణం పొందాడు. అలాగే ఫ్రాన్స్ జుమార్కు అనే జర్మన్ లలిత కళోపాసకుడు 1916 సం॥లో యుద్ధం చేస్తూ దేశంకోసం ప్రాణాలర్పించాడు.

మన తెలుగు కవులకు కూడా ఇలాంటి అనుభవాలు ఉన్నాయి. ఈ పవిత్రయజ్ఞంలో పాలుపంచుకున్నారు. తమ కలాల్ని తుపాకులుగా చేసుకొని ప్రబోధగేయాల్ని తూటాలుగా ఆంగ్లేయులపైకి వదిలారు. ఎందరో కవులు జాతీయోద్యమ కవితా రథసారథులయ్యారు. కొంతమంది కవుల కొన్ని గీతాలు మాత్రమే వెలుగులోకి వచ్చి ఎందరో కవులు అజ్ఞాతంలో ఉండిపోయారు. అలాంటి వారే దామరాజు పుండరీకాక్షుడు. తెల్లవారిపై నాటకాలతో సాయుధ పోరాటం చేసిన అరుదైన తెలుగువీరుడు దామరాజు పుండరీకాక్షుడు.

1898 జూలై 6న పూర్వ గుంటూరు (ప్రస్తుత పల్నాడు) జిల్లా సత్రెనపల్లి తాలూకా పాటిబండ్ల గ్రామంలో దామరాజు పుండరీకాక్షుడు జన్మించాడు. గుంటూరు, కృష్ణా, విశాఖపట్నం ప్రాంతాలలో ప్రాథమిక, ప్రాథమికోన్నత విద్యనభ్యసించి మద్రాసులో బి.ఏ., బి.ఎల్ (న్యాయశాస్త్రం) పూర్తిచేశారు. ఓ

వైపు చదువుకుంటూనే ... మరోవైపు బ్రిటీష్ కర్కషపాలనను తులనాదుతూ జాతీయోద్యమం వైపు ప్రజలను జాగృతం చేస్తూ తన సాహిత్యానికి పదునుపెట్టారు.

బి.ఎల్ చదువుతున్న సమయంలోనే పుండరీకాక్షుడి రచనలను ఆ కళాశాల యూరోపియన్ అధ్యాపకులు గుర్తించారు. ప్రతీకారచర్యగా పరీక్షల్లో ఉద్దేశపూర్వకంగానే ఫెయిల్ చేశారు. ఆయన దీనిపై సత్యాగ్రహ పద్ధతిలో నిరసన తెలుపుతూ అధిపతులను నిలదీశారు. చివరకు తమ వద్ద సమాధానమేమి లేక అధికారులు పుండరీకాక్షుడు ఉత్తీర్ణత సాధించినట్లు ప్రకటించారు. విద్యార్థి దశలోనే తెల్లవారిపై విజయం సాధించిన ఈ సంఘటనతో ఆయన 1920-29 సంవత్సరాల మధ్య అనేక జాతీయ రచనలద్వారా దేశభక్తిని, త్యాగనిరతనను పురిగొల్పాడు.

స్వాతంత్ర్యోద్యమం గాంధీ సారధ్యంలో మహోద్యమంగా జరుగుతున్న రోజుల్లో గాంధీ టోపీ పెట్టినా, గాంధీ మీద పాటపాడినా, గాంధీపై నినాదం చేసినా ఆంగ్లేయులు అగ్గిమీదగుగ్గిలం అయ్యేవారు. జాతీయోద్యమంలో గీతాలు రాయడాన్ని, వాటిని ప్రదర్శించడాన్ని రాజద్రోహ చర్యగా పరిగణించి చాలామంది కవులను, రచయితలను కారాగారాల్లో బంధించేవారు బ్రిటీష్ పాలకులు. ఆ బెదిరింపులను తాటాకుచప్పుళ్ళు కింద జమకట్టిన యోధుడు పుండరీకాక్షుడు. ఆ పరిస్థితుల్లోనూ గాంధీనే స్తుతిస్తూ, కీర్తిస్తూ ఉద్యమ ఆవశ్యకతను ప్రజలకు వివరిస్తూ నాటకాలు రాసి, ప్రదర్శిస్తుండేవారాయన.

'దైరాసుర..'

గుంటూరు గాంధీపేట (నేటి అరండలోపేట)లో పుండరీకాక్షుడు 'స్వరాజ్య సోపాననిలయం' ఏర్పాటు చేశారు. అక్కడి నుండి వెలువడిన దేశభక్తి గేయాలు, పాటలు, పద్యాలు, నాటకాలు, హరికథలు, బుర్రకథలు ఆంగ్లేయుల గుండెల్లో గుబులు పుట్టించాయి. జలియన్ వాలాబాగ్ దురాగతాన్ని 'మహాభారతం' కథలో ఇమిడ్చి పుండరీకాక్షుడు రాసిన 'పాంచాల పరాభవం' నాటకం అప్పట్లో ఓ సంచలనం. ఈ నాటకంలో జనరల్ డయ్యర్ ను 'దైరాసుర' గా సంబోధిస్తూ దుశ్మానునిడిగా భరతమాతను పాంచాలిగా, మహాత్మాగాంధీని కృష్ణుడిగా పోల్చారు. తెల్లవారిచేతుల్లో చిక్కి వెక్కివెక్కి ఏడుస్తున్న

తీ వర్ర చెన్నారెడ్డి ప్రభుత్వ డిగ్రీ కళాశాల, పలమనేరు - ప్రత్యేక సంచిక

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