3D Flower-Like Gadolinium Molybdate Catalyst for Efficient Detection and Degradation of Organophosphate Pesticide (Fenitrothion)

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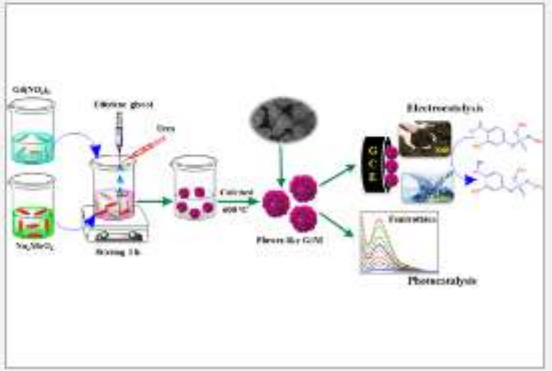
SUBJECTS: Catalysts, Degradation, Electrodes, Photodegradation, Redox reactions

Abstract

Three-dimensional (3D) nanostructured materials have received enormous attention in energy and environment remediation applications. Herein, we developed a novel 3D flower-like gadolinium molybdate (Gd_2MoO_6; GdM) and used as a bifunctional catalyst for the electrochemical detection and photocatalytic degradation of organophosphate pesticide fenitrothion (FNT). The flower-like GdM catalyst was prepared via a simple sol–gel technique with the assistance of urea and ethylene glycol. The properties of GdM were confirmed by various spectroscopic and analytical techniques. The GdM catalyst played a significant role in electrochemical reduction of FNT and results in a very low detection limit (5 nM), wide linear ranges (0.02–123; 173–1823 μM), and good sensitivity (1.36 μA μM^{-1} cm^{-2}). Interestingly, the GdM electrocatalyst had good recoveries to FNT in soil and water sample analysis. In addition to trace level detection, the flower-like GdM was used as the photocatalyst which portrayed an excellent photocatalytic degradation behavior to eliminate the FNT in the aqueous system. The GdM photocatalyst could degrade above 99% of FNT under UV light irradiation with good stability even after five cycles.



KEYWORDS: catalyst, pollutant, pesticides, fenitrothion, Gd_2MoO_6, electrocatalyst, photocatalyst

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A Note on Support Neighbourly Irregular Graphs

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Abstract: In any graph G, the support of a vertex is the sum of degrees of its neighbours. A connected graph G is said to be support neighbourly irregular (or simply SNI), if no two adjacent vertices in G have same support. In this paper, the necessary and sufficient conditions for some known families of graphs to be SNI have been discussed.

Key Words: Irregular graphs, support neighbourly irregular graphs, subdivision graphs, splitting graphs.

AMS(2010): 05C25.

§1. Introduction

Only finite, simple, connected, undirected graphs are considered in this paper. We refer [11] for further notations and terminology. The degree of a vertex v is denoted by *d(v)*. A *full vertex* of G is a vertex which is adjacent to every other vertices of G. A graph G is said to be r - *regular*, if every vertex of G has degree r. For $r \neq k$, a graph G is said to be *(r,k) - biregular* if *d(v)* is either r or k for any vertex v in G.

In a graph *G(V, E)*, for any vertex $v \in V$, the *open neighbourhood* of v is the set of all vertices adjacent to v. That is, $N(v) = \{u \in V(G)/\ uv \in E(G)\}$. The *closed neighbourhood* of v is defined by $N[v] = N(v) \cup v$. Clearly, if $N[u]=[v]$, then u and v are adjacent and $d(u) = d(v)$.

Let G_1 and G_2 be any two graphs. The graph $G_1 \circ G_2$ obtained from one copy of G_1 and $|V(G_1)|$ copies of G_2 by joining each vertex in the i^{th} copy of G_2 to the i^{th} vertex of G_1 is called the *corona* of G_1 and G_2.

The concept of support of a vertex has been introduced and studied by Selvam Avadayappan and G. Mahadevan [6]. The *support s(v)* of a vertex v is the sum of degrees of its neighbours. That is, $s(v) = \sum_{u \in N(v)} d(u)$. Note that the support of any vertex in an r - *regular* graph is r^2.

A graph G is said to be a *balanced graph,* if any two vertices in G have the same support. It is easy to observe that the complete bipartite graphs $K_{m,n}$ and any regular graphs are balanced graphs. A graph G is said to be *highly unbalanced,* if distinct vertices of G have distinct

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A Study on Consumer Attitudes towards Amway Products at Aruppukottai

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Marketing strategy, marketer, Amway Products

ABSTRACT

Consumer attitudes are both an obstacle and an advantage to a marketer. Choosing to discount or ignore consumers' attitudes of a particular product or service—while developing a marketing strategy—guarantees limited success of a campaign. A study was made on consumer attitude towards Amway Products. The aim of the present paper is to examine to what extent their need based of Amway products.

1. Introduction

Consumers are individuals with likes and dislikes. When the preponderance of people in a particular group feel one way or another about a product, service, entity, person, place or thing, it is said to be a generalized consumer attitude that could affect the marketing of that person, product or entity in positive or negative ways. Marketers strive to influence consumer attitudes, and understanding the prevailing attitude is the first step to changing it if needed.

Consumer Attitude is both an obstacle and an advantage to a marketer. Choosing to discount or ignore consumers' attitudes of a particular product or service—while developing a marketing strategy—guarantees limited success of a campaign. In contrast, perceptive marketers leverage their understanding of attitudes to predict the behavior of consumers.

An attitude in marketing terms is defined as a general evaluation of a product or service formed over time. An attitude satisfies a personal motive—and at the same time, affects the shopping and buying habits of consumers. Consumer attitude simply as a composite of a consumer's beliefs, feelings, and behavioral intentions toward some object within the context of marketing. A consumer can hold negative or positive beliefs or feelings toward a product or service. A behavioral intention is defined by the consumer's belief or feeling with respect to the product or service.

2. Objectives of the study

1. To find out the whether the Amway products are need based.
2. To offer suggestions in the light of findings of the study.

3. Data & Methodology

The study has mainly depended on primary and secondary sources of data. Primary data were collected by administering a well-conceived questionnaire to the respondents. The size of the sample was 200. Simple random sampling was used for the selection of the required number of samples.

4. Statistical tools used

- Relevant statistical tools such as
- Percentage calculation,
- Discriminant analysis

5. Review of literature

According to Goffman (1959) introduced the concept a 'managed situation', the idea that people manage the impression that others have of them by the way they present themselves. In the presence of others, the actor is seen to organize his activity in order to express an impression that he wishes to convey. The object of the study of role theory is to increase understanding of role enactment of individuals in social settings, so as to understand and predict behavior.

According to Holbrook and Hirschman (1982) the paramount goal of marketing is to understand the consumer and to influence buying behavior. One of the main perspectives of the consumer behavior research analyses buying behavior from the so-called "information processing perspective".

6. Research Gap

From the above discussion it is clear that, most of the studies made earlier focused on conspicuous consumption, managed situation, inclination, decision process relating to pre-purchase, post-purchase, consumer satisfaction, quality of consumer services, advertisement design, market product design, loyalty, values, consumer delight, successful competitive strategies and so forth .The studies were not made with reference to awareness, frequency of purchase factors influencing purchase of particular product. Further earlier studies were not made with particular reference to Amway products. The present study titled "A STUDY ON CONSUMER ATTITUDE TOWARDS AMWAY PRODUCTS AT ARUPPUKOTTAI" fills this research gap.

7. Findings

The frequency distribution of the profile of the respondent is shown in table 1.

A STUDY ON EMPLOYEES' STRESS TOWARDS ORGANIZATIONAL CULTURE IN PRIVATE HOSPITAL AT RAJAPALAYAM

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Abstract

Hospital sector is one of the most powerful health management agencies, which plays a major role to protect the people health. Every organization and business wants to be successful and have desire to get constant progress for that they following the organizational culture. This culture leads the organization in successful manner. Organizational culture means values, beliefs, norms, system, habits, vision, environment etc, while following this culture the employees have many difficulties. Organizational Culture includes everything that influences an employee in an organization. Each hospital has its own culture, as every organization different in their culture. This may reflect in their stress levels, which may in turn reflect in the individual productivity as well as the organizational. Majority of the employees' facing the different stress level at their work place. Employees' stress leads the organization down and also it will affect the individual work and families also. For this the organization analyst the employees' stress level and give a proper remedy for their workers. So, the researcher has proposed to undertake this study to overcome the above issues.

Keywords: Employees' Stress, Organizational Culture, Private Hospital.

INTRODUCTION

A hospital is a health care institution providing patient treatment with specialized staff and equipment. Healthcare in India covers not merely areas of providing medical care, but also all aspects of preventive care. It includes the medical care rendered by the public sector and the initiatives taken by the private sector. The health care industry in recent years has reorganized its service delivery system in order to carry on in an unmoved environment resulting from maturation of the industry, reduced funding, and increased competition. If one is sick, he/she goes to the doctor and expects him to fix it. If the doctor can't, he/she expects him to send the patient to a specialist who can. And the patient wants the full range of medical services regardless of his/her ability to pay. Thus, the post-modern hospital is a far different place as a result of the constant change in the needs and expectations of patients.

Stress is a part of each day life and not necessarily a negative fact, being a physiological stimulus usually connected with human-environment communications. Stress, particularly work-related stress, has aroused growing interest across the globe in recent years. The workplace has changed radically due to globalization of the economy, use of new information and communication technology, growing diversity in the workplace (e.g. more women, older and higher educated people, as well as increased migration), and an increased mental workload.

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An Analytical Study on Psychological Distress among Elder Persons in Virudhunagar Block

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ABSTRACT

Human resource is considered as an asset for a country. It plays an important role in economic development and growth. The huge young population is considered as its strength and it enhances its potential for faster growth. The global demographic trend, however, tells us that, with the passage of time, the countries have experienced ageing of population. The proportion of older persons in the population of a country has increased. . Aging is considered as natural and universal process. Ageing in Indian culture though considered disability, does not carry the connotation of becoming "Useless mouth to be fed..It is regarded as an inevitable biological phenomenon. Elderly people are suffering from various physical, mental, social and economical problems with emerging changes in our social and cultural values, the elderly who are economically unproductive are sadly neglected. This paper is going to analyze "Psychological Distress among Elder Persons in Virudhunagar Block". Against this above background the following objectives have been framed ((i) to analysis the health behavior of the respondents. (ii). to examine the psychological distress among the respondents. . The present study covers a period of one year i.e., from January 2017 to April 2017. The survey was conducted during this period. Both primary and secondary data were collected for the purpose of the study. Convenience sampling method was adopted in the present study to select the sample respondent.

Keywords: *ageing, elder persons, psychological distress*

I. INTRODCTION

Human resource is considered as an asset for a country. It plays an important role in economic development and growth. Greater the proportion of young persons in the population of a country, larger is the workforce, and, thus, more is the economic potential. India, in this sense, has got an advantage at present and is considered as a leading nation in the world in terms of human power. The huge young population is considered as its strength and it enhances its potential for faster growth. The

ANTI BACTERIAL ACTIVITY OF COMMERCIAL ANTIBIOTICS AND ZINC OXIDE NANOPARTICLES AGAINST SELECTED UTI PATHOGENS - A COMPARATIVE STUDY

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Abstract: The present study is concerned about the synthesis, characterization of zinc oxide nanoparticles and their use as antibacterial agent. Zinc oxide nanoparticles were synthesized by Co-precipitation method using zinc acetate and thiourea. The synthesized zinc oxide nanoparticles were characterized with X-ray diffraction analysis. The antimicrobial activity of zinc oxide nanoparticle was tested against UTI pathogens like, *Escherichia coli, Klebsiella pneumoniae, Pseudomonas aeruginosa, Proteus vulgaris* and *Staphylococcus aureus* using Well diffusion method. Similarly the antibacterial activity of standard antibiotics was tested against UTI pathogens using the disc diffusion method. The efficiency of zinc oxide nanoparticles was compared with that of standard antibiotics. The results showed that zinc oxide nanoparticles have strong antimicrobial activity against all tested pathogens except *Proteus vulgaris*.

Introduction:

The infectious diseases remain one of the greatest challenges to global health. Urinary tract infection (UTI) is the second most common clinical disease and possesses a significant healthcare burden. This infectious disease can alter the urinary system either structurally or functionally (Foxman, 2010). Worldwide about 150 million people are diagnosed each year with UTI's costing in excess of 6 billion dollars (Gupta *et al.,2001)* . UTI's are predominantly caused by bacteria. The most common bacteria implicated as causative agents of UTI generally originate in the intestine and include but not limited to *E.coli, Pseudomonas spp, Streptococcus spp, Proteus spp., Klebsiella spp., Staphylococcus spp*(El-Sweih *et al*., 2008). About 80 to 90 percent of UTIs are caused by a single type of bacteria *Escherichia coli* (Barnett and Stephens.,1997)

There is an urgent need to produce the new antibacterial agents from different sources. The terrestrial plant such as *Phylanthusamarus* and *Parquetinanigrescens* showed potential antibacterial activity against UTI pathogens(Oluwafemi F and Debiri F.,2008). Moreover, the marine resources such as mangroves, seaweeds, sponges, and sea grasses already showed antibacterial, antifungal(Ravikumar *et al*.,2010) and antiplasmoidal activities(Ravikumar *et al*.,2011).

Antibacterial Studies of Copper Complex Derived From Isoniazid Schiff Bases

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Abstract - The heterocyclic hydrazones constitute an important class of biologically active drug molecules which have attracted the attention of medicinal chemists due to their wide-ranging pharmacological properties including iron scavenging and anti-tubercular activities. Isoniazid, also known as isonicotinylhydrazide (INH), is an antibiotic used for the treatment of tuberculosis. In the present study a few mixed ligand copper complexes of isoniazid Schiff base have been synthesized. The synthesized compounds are characterized by elemental analysis, magnetic susceptibility, magnetic moment, UV and FT IR spectroscopic methods. PASS prediction analysis shows that the synthesized ligand posseses higher antituberculosis activity than the free isoniazid. All the synthesized compounds are screened for antimicrobial activity.

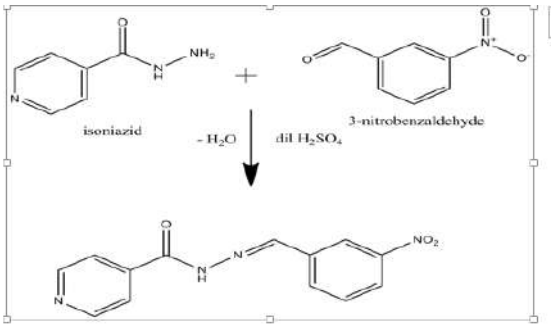
Keywords: Hydrazones; Isoniazid; Metal complex; Anti-microbial activity.

1. INTRODUCTION

Schiff base compounds and their metal complexes have been extensively investigated due to their wide range of applications including catalysts, medicine, crystal engineering, anti-corrosion agent[1]. Isoniazid is one of the primary drugs used in combination with ethambutol, rifampin, streptomycin and pyrazinamide to treat tuberculosis[2]. Common side effect of isoniazid includes increased blood levels of liver enzymes and numbness in the hands and feet. Serious side effects may include liver inflammation. It is unclear if use during pregnancy is safe for the baby and use during breastfeeding is likely okay. Pyridoxine may be given to reduce the risk of side effects. It has been reported that, its side effects can be reduced after forming Schiff base (due to the deactivation of NH_2 group)[3,4]. Mixed ligand complexes can be a synthetic challenge to tune the properties of the transition metal complexes[5]. Most active mixed ligand metal complexes of 1,10-phenanthroline derivatives that have been reported to prove considerable pharmacological activity. Transition metal complexes of 1,10-phenanthroline or their modified variants have been extensively employed in DNA studies due to their applicability in several areas of research, including bioinorganic and biomedicinal chemistry[6]. *In silico* analysis using cheminformatics techniques can actually reduce the risks of developing a drug. Such techniques as virtual screening, library design, and docking figure into the analysis. By keeping all these facts, this work emphasizes the synthesis of copper complex from isonazid Schiff base. The synthesized compounds are characterized by elemental analysis, magnetic susceptibility, magnetic moment, UV and FT IR spectroscopic methods. Biological activity of the synthesized ligand can be predicted by PASS online software. The antibacterial activity of these compounds is examined by well diffusion method.

2. EXPERIMENTAL SECTION

2.1. Synthesis of Isoniazid - Schiff's base ligand



N'-(3-nitrobenzylidene)isonicotinohydrazide

Scheme: 1 Schematic diagram for the synthesis of isoniazid Schiff Base

1 mmol of isoniazid and 3-nitrobenzaldehyde was dissolved in 10 mL of ethanol and it was heated in a mantle for *ca* 3 h in RB flask by adding 3 drops of dilute sulphuric acid. A yellow coloured precipitate was

BETA GLUCAN SYNTHESIS AND MYCOCHEMICALS SCREENING OF LYCOPERDON PERLATUM COLLECTED FROM SAYALGUDI, SOUTHERN TAMILNADU, INDIA

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***Abstract:** This work targets on β-glucan synthesis and analysis of mycochemicals present in the mushroom, Lycoperdon perlatum. The samples were collected from coastal region of southern Tamilnadu. The sample, that the surface sterilized fruit body was dried and stored in powder form. The mycochemicals were examined from the mushroom fruit body dried powder. The mushroom mycelium was grown on PDA plate by the spore inoculation. The production of extracellular enzymes from mushroom mycelium was detected. Beta-glucan was isolated from mycelium using submerged fermentation technique and purified. It was acid hydrolyzed using tri-fluoro acetic acid (TFA) and analyzed by thin-layer chromatography. Total protein content present in the mushroom was measured by Lowry's method. As like total carbohydrate content was measured by phenol and sulfuric acid method that contain 56% crude β-glucan. The result obtained from this study has shown the potential of Lycoperdon perlatum mushroom extract as a potent therapeutic agent and a food supplement.*

***Index Terms** – Lycoperdon perlatum, Beta-glucan, Mycochemicals, Extra cellular enzymes*

1. INTRODUCTION

Mushroom is the fruiting body of macro fungi (*Basidiomycota*) and produces only a short reproductive stage in their lifecycle (Hankin and Anagnostakis ,1975). Mushroom can be epigeous, large enough to be seen with the naked eyes and can be picked by hand (Chang and Miles, 1989). Mostly *Basidiomycetes* and *Ascomycetes* are the fruiting body producing fungi. Total mushrooms on the earth are estimated to be 140,000 species in which 10% (14,000 approximately) are known. From the thousands of known species, 2000 species are safe for human consumption and about 650 species of these having medicinal importance (Persoon, 1796). *Lycoperdon perlatum*, commonly known as puffball mushroom, is a species of puffball fungus in the family *Agaricaceae*. Mushrooms are the effective functional food as well as sources for the production of drugs having antioxidant, antitumor and antimicrobial activities (Kanad Das, 2010). Some mushrooms are consumed as potential nutriceuticals (compounds that having medicinal and nutritional characteristics and are consumed as medicines in the form of tablets or capsules) (Rai et al, 2005). The secondary metabolites of mushrooms are chemically diverse and possess a wide spectrum of biological activities, which are explored in traditional medicines and in new targets of molecular biology (Persoon, 1796. In twentieth century, mushrooms are well known to people all over the Asian countries as an important bio-source of novel secondary metabolites.

The puffball mushrooms are the good sources of protein, carbohydrates, fats and several micronutrients (Miura, 2003). The predominant fatty acids in the puffball are linoleic acid (37% of the total fatty acids), oleic acid (24%), palmitic acid (14.5%) and stearic acid (6.4%) (Perdeck, 1950). One of the anti-oxidant is β-glucan. β- Glucan is a polysaccharide (glucose polymers) that is found in many foods such as oats, barley, mushrooms and yeasts. Also, it is lesser extent in rye and wheat. It is extremely difficult to extract and purify. However, Oat bran contains about 7 percent beta glucan and is inexpensive. It is not enough to use as a supplement food. Non-cellulosic β-glucans are now recognized as potential immunological inducers and some are used medically in some countries (Rohrmann and Molitoris, 1992).

These β-glucans consist of a backbone of glucose residues linked by β-(1→3)-glycosidic bonds **(**Lakhanpal and Rana, 2005) often with attached side-chain glucose residues joined by β-(1→6) linkages. Instead of other carbohydrates, the use of β-glucans reduces the cholesterol and triglycerides (Cisneros et al, 1996). The effects on your face are dramatic and it gives a good result in your skin care by the routine massage (Robeiro, 2007) (Satitmanwiwat, 2012). The regular usage of β-glucans used to control blood sugar level in diabetic patients. β-glucan gives protection from ionizing radio activity. The literature suggests β-glucans are effective in treating diseases like cancer **(**Cheung, 2002) a range of microbial infections and hyper cholesterolaemia **(**Chen and Seviour, 2007). *Lycoperdon perlatum* was first studied by mycologist Christian Hendrik Persoon in 1796 (Almendros et al, 1987). The main reason to take beta glucan from the other contents is to induce our immune system. β-glucans have several different structures and different affinities towards receptors. This nature produces different host immune responses.

This study focuses on the synthesis of β-glucan and characterization of mycochemicals present in the mushroom, *Lycoperdon perlatum* was analyzed. This mushroom was collected from coastal regions of southern Tamilnadu, India. It was surface sterilized and the dried fruit body was stored in a powder form. The mushroom mycelium was isolated in PDA plate using spores. Mycochemical analysis was done and various fungal metabolites were examined.

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Original Article

Biogenic fabrication of gold nanoparticles using *Camellia japonica* L. leaf extract and its biological evaluation

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ABSTRACT

Development of green technique for the fabrication of noble metal nanoparticles is of great importance in order to avoid the usage of toxic chemicals. In this strategy, gold nanoparticles (AuNPs) are synthesized at room temperature by using *Camellia japonica* leaf extract under room temperature. The successful formation of AuNPs was confirmed by various spectroscopic techniques including UV, FTIR, XRD and SEM studies. The resulting antimicrobial activity of the synthesized AuNPs stabilized in *C. japonica* is tested against seven different microbial strains such as *Bacillus subtilis*, *Staphylococcus aureus*, *Streptococcus faecalis*, *Klebsiella pneumoniae*, *Pseudomonas aeruginosa*, *Escherichia coli* and *Candida albicans*. The present study opens a new window for future synthesis of AuNPs *via* green technique.

1. Introduction

Nanotechnology has recently advanced as a great interdisciplinary area of research, developing new nanoscale structures, properties, particle size and morphology. Metal nanoparticles have unique physical and chemical properties that are significantly different form bulk properties. Noble metal nanoparticles such as Ag, Au, Pd and Pt possess great advantages in the field of physics, chemistry and biological aspects [1–6]. Among them, gold nanoparticles (AuNPs) have been considered for many applications in biomedical science including drug delivery, tissue/tumor imaging, photothermal therapy, catalysis and biochemical sensors due to their extraordinary physicochemical properties [7–13]. Therefore, various researchers [14–18] have developed different methods for the synthesis of AuNPs by using different chemicals (sodium citrate, elemental hydrogen, $LiAlH_4$, *etc.*), which act as reducing agents.

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Cellulase and Xylanase Production by *Pleurotus* sp. on Mixed Substrate System

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Abstract

In this study, *Pleurotus flordia* and *Pleurotus djamor* is used for solid state fermentation studies and sugarcane bagasse, wheat bran and sugarcane bagasse with wheat bran (in different ratio) are used as the substrate. The fermentation studies are carried out in 7 days intervals up to 28 days. Sugarcane bagasse and wheat brane has the highest degradation of cellulose and hemicelluloses. The mixed substrate (sugarcane bagasse with wheat bran) has comparatively low degradation of cellulose and hemicellulose. *P.djamor* plays better performance in cellulase and xylanase production. Cellulase production is enhanced in sugarcane bagasse by *P.djamor* mean while xylanase production is enhanced in wheat bran by *P.djamor*. Both *P.djamor* and *P.florida* has obstructed on cellulase and xylanase production on mixed substrate (sugarcane bagasse mixed with wheat bran)

Keywords: *P.florida*; *P.djamor*; Cellulose; Xylanase; Fermentation

Introduction

Pleurotus sp. are wood destroying saprophytic fungi which occur widely in the tropical and temperate zones [1]. Species of *Pleurotus* are commonly known as "Oyster Mushroom". *P.sajor-caju, P.fabellatus*, *P.erungii*, *P.citrinipileatus* are commonly cultivated [2]. Bioconversion of lignocellulosic residues through mushroom cultivation offers the potential of converting them into protein rich, palatable food [3]. As early as straw is found to be a good substrate for growing *Pleurotus* [4] since that time, it's use has been studied in most of the rice producing countries of the world. The ability of *Pleurotus* species to excrete hydrolyzing and oxidizing enzymes has enabled them to flourish over a wide range of natural lignocellulosic waste materials [5,6]. India has great future to cultivate mushrooms. It can be artificially cultivated on different agricultural waste like paddy straw, wheat straw, sugar cane bagasse and etc.,. The artificial cultivation of oyster mushroom has not only economically efficient for farmers and has the ability to produce extracellular lignocelluloytic enzyme like cellulase, xylanase, lignin peroxidase, manganese peroxidase and laccase [7,8].

In recent years, the lignolytic degradation and extra-cellular enzyme production by *Pleurotus* sp. has been extensively studied. The enzyme excretion have varied during colonization and fructification stages of *Pleurotus* growth [9]. To overcome these crises, various methods have been used for the production of extra-cellular enzyme [10]. Enumerated the advantages of extra-cellular enzymes production by *Pleurotus* through Solid State Fermentation (SSF) [11]. Showed about ligninolytic and celluloytic enzyme pattern and activities were influenced by substrate. Thus, the capacity of particular substrate to induce or increase production of lignocellulases is another factor that indirectly confers ability of extra-cellular enzymes production. The present study is focused on the production of cellulase and xylanase enzymes using *Pleurotus florida* and *P.djamor* on sugarcane bagasse, wheat bran and sugarcane bagasse mixed with wheat bran (co substrate) through Solid State Fermentation.

Materials and Methods

Pure cultures and maintenances

Pure culture of *Pleurotus flordia* and *P.djamor* were obtained from Tamilnadu Agriculture University, Coimbatore, Tamilnadu, India. They are maintained in Maltose Extract (ME) Medium, at pH 5.8 and incubated for at 25^{0}C and are sub-cultured regular interval of three weeks.

Substrate preparation and inoculation

Agriculture residues, Sugarcane bagasse and wheat bran were procured locally and allowed to dry. The agricultural residues were milled and powders made which were passes through 1 mm sieve.

Determination of cellulose and hemicellulose

Cellulose is estimated colorimetrically by the method described by [12]. Pure cellulose is used as the standard and it is obtained from Sigma-Aldrich. Hemicellulose is estimated colorimeterically by the method described by [13]. Pure xylose is used as the standard and it is obtained from Sigma-Aldrich.

Solid state fermentation studies

Ten gram of the substrate by dry weight is taken in 250ml flask and 60% of moisture is set for the substrate with distilled water and sterilized at 121^{0}C for 30min. After cooling, each flask is inoculated with five agar discs from the edges of actively growing colonies of *P.florida* and *P.djamor.* After inoculation, the flasks were incubated at 27 ± 1^{0}C. SSF is carried out in once every seven days.

Enzyme extraction

Sodium citrate buffer is used for enzyme extraction. The substrate is squeezed with sodium citrate using cheese cloth to get the culture filtrate. This is used as an enzyme source and is stored in refrigerator at 0^{0}C until use. Enzymatic assays are done in triplicate.

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Classification of Dengue Serotypes Using Protein Sequence Based on Rule Extraction from Neural Network

Pandiselvam Pandiyarajan ✉ & Kathirvalavakumar Thangairulappan

Conference paper | First Online: 18 December 2018

Part of the Lecture Notes in Computer Science book series (LNAI,volume 11308)

Abstract

Dengue virus is a growing problem in tropical countries. It serves disease, especially in children. Some exiting clinical methods CIMSiM, DENSiM, ELISA, SPSS, SARIMA, PCR and RT-PCR need a volume of blood cells which cannot be obtained from children. Meanwhile, some existing machine learning algorithms are used to diagnose the dengue infection based on the date of dengue fever, days, current temperature, white blood cell count, joint muscles, metallic taste in mouth, appetite, abdomen pain, hemoglobin, mild bleeding, vomiting, headaches, rainfall, and relative humidity attributes. These methods are used to diagnose the dengue in later stages. Sometimes these methods could not identify the correct results. To overcome these problems, this paper proposes the stable method of classifying dengue serotypes based on amino acids in the protein sequences. It needs only skin cells or hair or nail which can be easily obtained from any person including children also. The proposed method classifies dengue serotypes using entropy-based feature selection and rule extracted from the neural network. Results of the experiments show that the proposed method for classifying dengue fevers with its serotypes.

Keywords

Dengue diagnosis | Protein sequence | Neural network | Classification | Rule extraction

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Combined Larvicidal and Pupicidal Action of *Coriandrum sativum*, *Piper nigrum* and Synthetic Insecticide Cypermethrin Against the Dengue Fever Mosquito, *Aedes Aegypti* L.

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ABSTRACT
After the adoption of green revolution, India has The combined action of cypermethrin and methanolic extracts of *Coriandrum sativum, Piper nigrum* were observed for their larvicidal and pupicidal activites against *Aedes aegypti*. When analyzed individually, Cypermethrin were found to be most effectual against the first instar larvae of *Aedes aegypti,* followed by methanolic extracts of *Piper nigrum, Coriandrum sativum* being least effective. The LC_{50} values obtained with Cypermethrin and methanolic extracts of *Piper nigrum, Coriandrum sativum* against the first instar larvae were 0.61, 0.71 and 0.86%, respectively and the LC_{90} values were 1.32, 2.73 and 3.71% respectively. The combination of Cypermethrin and *Coriandrum sativum* was studied at mixed with Cypermethrin 0.5% and *Coriandrum sativum* 0.5, 1.0, 1.5, 2.0 and 2.5. Similar mixtures were also used for the combination of Cypermethrin and *Piper nigrum*. The Cypermethrin and *Coriandrum sativum* seed extract combination acted antagonistically. The combination of Cypermethrin and *Piper nigrum* seed extract acted synergistically against the target organisms at a first instar larvae, which showed the best results of: LC_{50} 0.58 and LC_{90} 2.40% at 24 hours, respectively. The present study will be helpful in developing in a commercial formulation for effective vector management.

Keywords: *Cypermethrin, Coriandrum sativum, Piper nigrum, Aedes aegypti, larvicide, pupicide and synergism*

INTRODUCTION
Mosquitoes are major public health pests throughout the World. Among the 3492 species of mosquitoes recorded Worldwide, more than a hundred species are capable of transmitting various diseases to humans and other vertebrates (Rueda, 2008). Many devastating diseases such as malaria, West Nile virus (WN), dengue, filariasis, yellow fever, Japanese encephalitis and chikungunya are transmitted to humans by vector mosquitoes. Also mosquito bite causes considerable pain and leads to loss of sleep. Mosquito attack on frame animals can cause loss of body weight and decreased milk production (Nour *et al*., 2009). The *Aedes aegypti* mosquito is the primary vector of dengue. The *Aedes aegypti* mosquito lives in urban habitats and breeds mostly in man-made containers. Unlike other mosquitoes *Aedes aegypti* is a daytime feeder; its peak biting periods are early in the morning and in the evening before dusk. Female *Aedes aegypti* bites multiple people during each feeding period. As estimated 500 000 people with severe dengue require hospitalization each year, a large proportion of whom are children. About 2.5% of those affected die. Dengue has become the most important mosquito-borne viral disease affecting humans (WHO, 2009). Dengue fever is a severe, flu-like illness that affects infants, young children and adults, but seldom causes death. Dengue should be suspected when a high fever (40c-/104F) is accompanied by two of the following symptoms; severe headache, pain behind the eyes, muscle and joint pains, nausea, vomiting, swollen glands or rash.

Composites from renewable and sustainable resources: Challenges and innovations

AMAR K. MOHANTY , SINGARAVELU VIVEKANANDHAN, JEAN-MATHIEU PIN, AND MANJUSRI MISRA Authors Info & Affiliations

SCIENCE · 2 Nov 2018 · Vol 362, Issue 6414 · pp. 536-542 · DOI: 10.1126/science.aat9072

Abstract

Interest in constructing composite materials from biosourced, recycled materials; waste resources; and their combinations is growing. Biocomposites have attracted the attention of automakers for the design of lightweight parts. Hybrid biocomposites made of petrochemical-based and bioresourced materials have led to technological advances in manufacturing. Greener biocomposites from plant-derived fiber and crop-derived plastics with higher biobased content are continuously being developed. Biodegradable composites have shown potential for major uses in sustainable packaging. Recycled plastic materials originally destined for landfills can be redirected and repurposed for blending in composite applications, thus leading to reduced dependence on virgin petro-based materials. Studies on compatibility of recycled and waste materials with other components in composite structure for improved interface and better mechanical performance pose major scientific challenges. This research holds the promise of advancing a key global sustainability goal.

Consumers Satisfaction towards Electronic Goods in Virudhunagar District

M.Suresh and P.Sundara Pandian

Department of Commerce, V.H.N. Senthikumara Nadar College (Autonomous), Virudhunagar.

Abstract - India is witnessing a noteworthy development in manufacturing industries since 1947. Though various industries are producing different kinds of products, electronic goods occupy a predominant position in Indian market. Electronics is one among the world's largest and fastest growing industries. In the past two decades, the electronic sector has been growing faster than any other sectors. The objective of the study is to know the level of satisfaction of consumers about the electronic goods and to analyse the factors influenced for selecting electronic goods. For this study, 200 respondents were selected from the study area Virudhunagar district by convenient sampling method. In order to find the association between the level of satisfaction about electronic goods based on gender, family income and age group. The orders of merit given for factors influenced for selecting electronics goods by the respondents were converted into Henry Garret Ranking and an attempt was made to analysis the features of electronic goods on a weighted average ranked basis. The producer must be paid special attention at least with regard to price and distribution system to cover the large number of customers. The idea must be build for better brand image and the quality is also must be checked frequently for a better customer satisfaction.

Keywords: Awareness, Consumers Satisfaction, Electronic Goods Awareness

1. INTRODUCTION

India is witnessing a noteworthy development in manufacturing industries since 1947. Though various industries are producing different kinds of products, electronic goods occupy a predominant position in Indian market. Hence, new industries have emerged and concentrating more on technological up gradation on a par with the leading electronic manufacturing countries such as Japan, Korea etc., The consumer electronics industry has witnessed a unique growth over the past few years. This growth can be attributed to the increasing effect of state of the art electronic devices on the market. The consumer electronics industry is ushering in the dawn of convergence. It is the confluence and merging of hitherto separated markets of digital based audio, video and information technology, removing entry barriers across the market and industry boundaries. Technological changes, especially in the electronic sector, have paved the way for the new opportunities. The political, socio-economic and technological changes as the global scenario reflected in the performance of Indian electronic industries. A long recession in the demand of consumer electronic products, especially television, audio systems, refrigerator, washing machine etc., has affected this industries lot.

Electronics in one among the world's largest and fastest growing industries. In the past two decades, the electronic sector has been growing faster than any other sectors. The growth in the electronic sector is associated with the increasing demand for existing products. Introduction of new products, opening new markets in the rural and sub-urban areas, penetration of electronics into rest of the economy of a nation. This global marketing strategy creates good awareness among the consumer of electronic goods and through these products, standard of living has enhanced. By seeing advertisements in the television and in other medias the rural and suburban customers come forwards towards a change of lifestyle by purchasing electronic goods even installment basis.

Based on the above issues the following questions were probed:

1. To what extent the consumers are aware of electronic goods.
2. What is the level of utilizing the electronic goods?
3. What are the common problems faced in electronic goods marketing.

2. REVIEW OF LITERATURE

Rizwana Ahmed (1992)In her thesis entitled "Consumer buying decision for consumer durable goods" opined that, the

CUSTOMER SATISFACTION ON SERVICE QUALITY IN INDIAN RAILWAY WITH REFERENCE TO VIRUDHUNAGAR

M. Anantha lakshmi[1]
Dr. G. Murugesan[2]

ABSTRACT

The present study focus on analyze the customer satisfaction on service quality in Indian railways has a very highly influence service quality. Various authors are describing the various problems about service quality. The passengers are expected more number of services but Indian railways is providing a small number of services are good quality and many of services are not good. Once the Indian railway is not fulfill the passenger expectation they are ready to switch over to another mode of transportation service. So this study to identify the railway passenger and to analyze the gap between the passenger exception and perception of the service quality. So the researcher has proposed to undertake this study to overcome the above issues.

Key words: Indian Railway, Service gap, passenger satisfaction, southern railways.

INTRODUCTION

The Indian railways provide the opinion approach of transportation for freight and passengers. Indian railways have been a fundamental element of the social, political and economic life of the country. This network has not only included markets but also people crossways extent and span of the country. It has clear the financial life of the country and helped in accelerating the development of the industry. Indian railway is one of the fast increasing service sectors which activate trains in and just about diverse parts of the country. It offers a choice of facilities to the passengers and making truthful attempt to develop and improve the infrastructure arrangement in the relevant railway junction. The benefits of new technology and development of atomization have been taken into account for given that various services to the Indian passengers.

OBJECTIVES OF THE STUDY

- To find out the demographic profile of the passengers.
- To evaluate the gap between the passenger expectation and perception of the Service quality.

REVIEW OF LITERATURE

J.Priyadharshini and M.Selladurai, (2016)[3]In this paper the study is able to complete research objectives, by carefully analyzing and identifying aggressive location of railway strength and weakness among the passengers. Indian railways should go behind receiving the review feedback from the passengers in their respective trains at least three to six month once. The reservation systems and infrastructure facilities in both trains and railway stations has to be improved. The railway staffs and assistant or helper can appoint for each coach and improved security system towards the passenger's expectations. Hence the human touch is more required as we compare airlines services which we missing in Indian railway passenger services. In this aspects more recover its show in the satisfaction levels of the passengers and take up a leading arrangement among the customer mind in enduringly.

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[3] Service Quality and Passengers Satisfaction of Southern Railways by ServQual Model , International Journal of Trend in Research and Development, Volume 3(6), ISSN: 2394-9333, IJTRD | Nov-Dec 2016

Design and synthesis of bandgap tailored porous Ag/NiO nanocomposite: an effective visible light active photocatalyst for degradation of organic pollutants

Published: 08 October 2018

Volume 29, pages 20367–20382, (2018) Cite this article

Saravanakumar Karunamoorthy & Muthuraj Velluchamy

Abstract

In this work, a series of novel visible light driven Ag/NiO nanocomposites were synthesized via a facile one-pot hydrothermal method. The phase structure, morphology and optical properties of the as-prepared materials were characterized by various tools including X-ray powder diffraction, X-ray photoelectron spectroscopy, scanning electron microscopy, high resolution transmission electron microscopy, energy dispersive X-ray analysis with mapping, the Brunauer–Emmett–Teller surface area, UV–Vis diffuse reflectance spectroscopy and photoluminescence spectroscopy. Ag/NiO nanocomposites have strong visible-light absorption and narrow energy bandgap of 2.55–3.01 eV, and exhibit excellent photocatalytic activity than pure NiO on the degradation of sunset yellow (SY) and tartrazine under visible light irradiation. The incorporation of Ag into NiO can decrease the bandgap, enhance the photoinduced interfacial charge transfer, and therefore increase the charge separation efficiency during the photocatalytic process. In addition, the Ag nanoparticles served as an electron trap site and prolong lifetime of the charge separation state. Among the series of synthesized Ag/NiO nanocomposites, (5%) Ag/NiO nanocomposite display higher separation of photo-induced charge carriers, which could be mainly responsible for the outstanding photocatalytic activity. The radicals trapping experimental results revealed that photogenerated $O_2^{\cdot-}$ and $^{\cdot}OH$ radicals were the main reactive species for the degradation of SY. These combined effects endowed the Ag/NiO nanocomposite system with the ever-increasing photocatalytic efficiency and enhanced stability in degradation reaction process.

Design of Novel Ytterbium Molybdate Nanoflakes Anchored Carbon Nanofibers: Challenging Sustainable Catalyst for the Detection and Degradation of Assassination Weapon (Paraoxon-Ethyl)

Raj Karthik, Jeyaraj Vinoth Kumar, Shen-Ming Chen*, Thangavelu Kokulnathan, Han-Yu Yang, and Velluchamy Muthuraj

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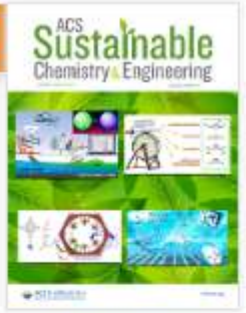
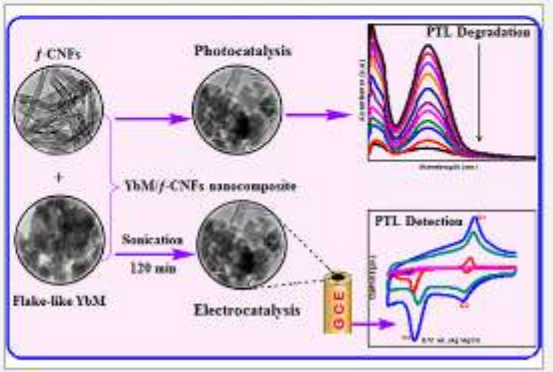


ACS Sustainable Chemistry & Engineering

SUBJECTS: Catalysts, Degradation, Electrodes, Nanocomposites, Photodegradation

Abstract

Design of resourceful and sustainable catalyst for the trace level identification as well as detoxification of toxic pollutants into the environment is a major concern to researchers. In view of that, we developed novel flakelike ytterbium molybdate ($YbMoO_4$; YbM) anchored on carbon nanofibers (YbM/*f*-CNFs) nanocomposite via simple wet-chemical route followed by a sonication process. The physicochemical properties of as-prepared YbM/*f*-CNFs were carried out by several spectroscopic techniques. The YbM/*f*-CNFs nanocomposite exhibited excellent electrocatalyst as well as photocatalyst for the detection and detoxification of chemical warfare agent paraoxon-ethyl (PTL). Interestingly, the electrochemical results illustrated that the YbM/*f*-CNFs nanocomposite exhibited an excellent electrocatalytic activity in terms of enhanced cathodic peak current and lower peak potential when compared with other modified electrodes. Furthermore, the YbM/*f*-CNFs modified electrode showed more extended linear response ranges (0.01–12 and 14–406 μM), lower detection limit (2 nM), good sensitivity (2.8 $\mu A \mu M^{-1} cm^{-2}$), and excellent selectivity for the PTL sensing. Besides, the YbM/*f*-CNFs catalyst had good recovery to PTL in soil and water sample analysis. In addition, the YbM/*f*-CNFs nanocomposite possesses remarkable photocatalytic activity and stability toward the degradation and mineralization of PTL under visible light irradiation. Furthermore, a possible detection and degradation mechanism was proposed toward PTL. This study provides a novel idea for the design of proficient and stable bifunctional catalyst for the real-time identification and remediation of lethal pollutants.



KEYWORDS: Chemical weapon, Organophosphate, Paraoxon-ethyl, Detection, Degradation

Sensors and Actuators B: Chemical
Volume 270, 1 October 2018, Pages 353-361

Development of novel 3D flower-like praseodymium molybdate decorated reduced graphene oxide: An efficient and selective electrocatalyst for the detection of acetylcholinesterase inhibitor methyl parathion

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Diasporic sensibilities in as if currimbhoy's *darjeeling tea?*

Abstract

Asif Currimbhoy is a prolific playwright in English. He, India's first authentic voice in the theatre, pens down with social purpose. He has produced many interesting plays. His numerous plays disclose his deep concern for dramatic effectiveness. He has dealt with the various shades of diasporic elements in his plays. In "Darjeeling Tea?" he exposes the lasciviousness and lavishness of the expatriate planters, especially the drunkenness of Bunty, the Brown Sahib. However, this paper analyses the general elements of diaspora in various forms along with Currimbhoy's "Darjeeling Tea?"

Key Words: Diasporic sensibilities, expatriate, discontents, dislocation, homeland

Effectiveness Of Civic Service Delivery System In E-Governance Centres At Kovilpatti And Its Environs

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ABSTRACT

The civic service delivery is a dynamic process which plays a predominant role for society. Changes and development through e-Governance is the transitional media for initiating effective and efficient civic services among government services. Applying and delivering the civic service is faster and easier today by re-engineered with e-Governance. The study illustrates that how citizens realized the e-Governance in receiving civic services. The study was restricted with some civic services available in e-Governance centre around kovilpatti taluk. Findings of the study interpret such positive impact among citizens about effectiveness of services available at e-Governance centre in kovilpatti taluk.

INTRODUCTION

E-Governance-meaning

E-Governance is also known as electronic governance which is basically the application of Information and Communications Technology to the processes of Government functioning in order to bring about 'Simple, Moral, Accountable, Responsive and Transparent' governance (Governance for The Tenth Five Year Plan (2002-2007), Planning Commission, November, 2001).

E governance involve the use of ICTs by government organisations for Exchange of information with citizens, businesses or other government departments, Faster and more efficient delivery of public services, Improving internal efficiency, Reducing costs / increasing revenue, Re-structuring of administrative processes and Improving quality of services. The government's National e-Governance Plan has led to multiple e-governance projects being executed in various states at various departments.

Civic services delivery system through e-Governance centre

ICT has changed the way urban civic authorities work, thanks to the government's e-governance initiative focused on eight core areas, namely property tax, Birth and Death certification, payroll and personnel, building plan approval, e-procurement, water and electricity bill payments, grievance redressal system, project and ward works. E-governance in an urban body's administration boosts efficiency and improves service delivery, coupled with cost reduction and bringing transparency. E-governance is being used in diverse public services delivered by urban civic authorities, such as municipalities, municipal corporations and corporations, as the case may be. Several e-governance initiatives are currently being implemented in urban local bodies across the country.

LITERATURE REVIEW

Municipal governance in India has existed since the year 1687, with the formation of Madras Municipal Corporation, and then Calcutta and Bombay Municipal Corporation in 1726. In the early part of the nineteenth century almost all towns in India had experienced some form of municipal governance. In 1882 the then Viceroy of India, Lord Ripon, who is known as the Father of Local Self Government, passed a resolution of local self-government which laid the democratic forms of municipal governance in India. Later, some of the services are classified and provided under the e-Governance centres at every taluk level.

International level

Abdulaziz Albesher (2015) in his thesis **"Trust as a Source of Long-Term Adoption of E-government"** mainly investigates the relationship between citizens' acceptance, use and trust, and the associated consequences of these concepts on the adoption of e-government services. So far, no independent study has explored the implications of citizens' trust on the behavioural use intention and adoption of e-Government services in Saudi Arabia. Full capacity of e-government services cannot be achieved without citizens' acceptance, participation and adoption of these electronic services. In addition, the rate of citizens' usage and adoption of e-government services is considered a significant determinant of the success or failure of an e-government system.

National level

S. S. Sreekumar (2005) in his research paper entitled "E-Governance - The Case of Andaman & Nicobar Islands" deals with the attempts made on the application of information technology by government agencies intending to transform relations with citizens in the remote area of Andaman and Nicobar Islands to implement e-Governance in various areas of administration. With the objective of developing citizen friendly administration especially at the grass root level. Departments of Revenue, Civil Supplies, Health, Electricity and Education have introduced e-governance. E-governance projects presently in operation in these Islands are also dealt with future plans for e-governance activities to be undertaken by Andaman and Nicobar Administration.

State level

P. Rajan Chinna (2013), in his thesis entitled as **"E-Governance in Theni Revenue District Administration – A Study"** highlights the initiatives of e-Governance have been made in India through National e-Governance Plan, National

Emotional Intelligence and Marital Satisfaction of Law Enforcement Officers and Others in Virudhunagar District – A Comparative Study

R.Shobana Devi and P.Sundara Pandian

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Abstract - The family has always been one of the most important parts of each society in the history of mankind and in all countries. Marital satisfaction means adaption of person's expectation from matrimony and what he himself experience in life, which is also important. Nowadays, for many employees, successfully combining work and non-work has become a major challenge that sometimes creates problems or conflicts. Law Enforcement Officers work long hours (shifts) assigned to patrol or investigations. Officers also work part-time jobs as private security when they are not on the department clock. To study the different elements of emotional intelligence and marital satisfaction among the Law Enforcement Officers and others in virudhunagar district for that Standard Deviations of Demographic Variables, the Comparison of average score of Marital Satisfaction Subscales, the Comparison of the average rate of Emotional Intelligence's Subscale Score and Regression Model for Impact of Emotional Intelligence on Marital Satisfaction was studied. The present research showed a positive and strong relation between the soundness of emotional intelligence and marital relations quality.

Keywords: Emotional Intelligence, Marital Satisfaction, Law Enforcement Officers

1. INTRODUCTION

The family has always been one of the most important parts of each society in the history of mankind and in all countries. Consequently, this very important factor plays a very important role in the progress and stability of the society. Anyway, the formation of family is based on marriage. Marriage is a mutual, delicate, and complicated relationship between two humans which has a basic role in meeting man and woman's emotional-psychological and physical demands Marriage is a symbiosis of a man and a woman, who has made a commitment and takes an oath, and accordingly has changed themselves. With the evolution of cultures, marriage has become a religious and sacred rite and tradition. However, any failure in marriage, as a commitment and oath, will socially label the sides. Not all marriages, necessarily, are successful and prosperous and some of them result in a separation. Some of the couples solve their sense of dissatisfaction and grievance through separation and divorce. All in all, from the second half of the 1970s, satisfaction has been declining; but many couples also prefer to stay in a state of conflict or mere indifference. In spite all these discouraging information about marriage, many people opt to marry. John Gottman's states that when there is no problem to make a crisis in a married life couples urge to report a high level of satisfaction. Consequently, many researchers have revealed that a perfect marriage will cause people to have a healthier and happier life

Marriage is a pleasing bond but findings of researches show that more than half of the marriages in the United States lead to disappointment and separation. Therefore, a majority of researchers try to figure out the elements which affect the level of satisfaction and persistency in interpersonal relationships including marriage. According to the researches done about the spouses' relationships it seems that components of emotional intelligence can be influential on marital satisfaction. Couples' intimate relationship needs communication skills such as: paying attention to other person's viewpoint, being able to empathisize perception with what their partner has experienced, and also being sensitive and aware of his / her needs. Marital satisfaction means adaption of person's expectation from matrimony and what he himself experience in life, which is also important. Winch believes marital satisfaction is adjustment between the current condition and the expected or ideal condition. Some of the authorities define marital satisfaction as a

Entrepreneurship &Financial Literacy: A Roadmap to Economic Development of India

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Abstract

Our India, one of the largest countries where its population is increasing continuously. In 2017, 66.23 percent of the total population of our country is youth which shows that our country is a young country. The youth of the nation are trustees of prosperity. A Huge reservoir of youthful energy which needs to be tapped and harnessed intelligently for the development of society. In the progress of an economy economically and industrially entrepreneurs are the catalysts of an economy. The countries like the United States of America, Japan etc., are developed because they have countless examples of successful entrepreneurial ventures. From this, it is very clear that entrepreneurial development role in emerging of powerful economies in the world. While on the other side, some countries like Mynamar, Nepal are remained backward due to poor entrepreneurial development. To put the youth on the track of economic progress, transforming youth from job seekers to job makers through nurturing entrepreneurship skills and sound financial literacy. So this paper focuses on the two factors inter-related to the economic development of India, i.e. financial literacy and entrepreneurship which goes hand in hand. In this context, this paper stresses the role of financial literacy in entrepreneurship and the impact of entrepreneurship on economic growth.

Keywords: Economic development, entrepreneurship, financial literacy

Introduction

For entrepreneurship culture, our country provides a successful platform. India grabbed the fifth position in the world on the basis of a large number of startups as entrepreneurs play as a catalyst for transformation. Through their micro ventures, they help in accelerating the growth process by influencing macroeconomic variables. The capability of entrepreneurs penetrating as a ray of transformation which is essential for an emerging country like India. Today so-called powerful economies like the US, Japan etc. are developed due to the countless examples of successful entrepreneurial ventures. While on the other hand it was observed that the absence of entrepreneurial culture in countries like Nepal, Bangladesh etc. remains backward economies. Coming to our economy, we can observe the same impact of entrepreneurs in the growth of states like Punjab, Gujarat. From this, it was strongly proven that there is a need of initiatives

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ENVIRONMENTAL SUSTAINABILITY BY MANUFACTURING INDUSTRIAL UNITS IN VIRUDHUNAGAR DISTRICT

A.A. Magesan, P. Rajmohan

ABSTRACT

Adoption of environmental sustainability has become a critical issue for service and manufacturing sector in all over the world. In order to survive in today's competitive world and business environment, adoption of environmental sustainability has become a necessity. Adoption of environmental sustainability not only brings lot of social and economic benefits to the manufacturing industries but also protect the environment. Such benefits includes increase the production, goodwill of the industry, eco-friendly production, improve business profile and consumer satisfaction. The study brings forth that the adoption of more environmental sustainability depending on the form of organization, amount of investment and category of industry shall enable their faster development in sustainable way.

KEYWORDS

Environment, sustainability, manufacturing practices, adoption, environmental friendly, manufacturing industry.

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ETHNOMEDICINAL USE OF PTERIDOPHYTE FROM COURTALLUM HILLS, TIRUNELVELI DISTRICT, TAMIL NADU, INDIA

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ABSTRACT

The study enumerates the Pteridophytes widely used by the local people and tribes in the treatment of various diseases in Courtallum hills of Tirunelveli district. They grow in terrestrial, epiphytic and lithophytic habitat. The present study deals with the ethnomedicinal uses of available Pteridophytes plants which are prevalent in study area, along with botanical name, family, habitat, plant part used and mode of uses.

KEYWORDS: Ethonomedicine, Pteridophytes, Courtallum, Medicinal properties.

INTRODUCTION

Pteridophytes are the seedless vascular cryptogams which occupy a position between the lower non-seed bearing and higher seed bearing plants from generally much neglected group of plants. About 250 millions years ago, they constituted the dominant vegetation on earth surface. However, they are now replaced by seed bearing plants in the modern day flora. Pteridophytes grow luxuriantly in moist tropical and temperate forest and their occurrence in different eco-geographically threatened regions from sea level to the highest mountain are of much interest. About 12, 000 species of Pteridophytes occur in the world flora of which about more than 1,000 species into 70 families and 191 genera likely to occur in India (Dixit, 1984). Recent studies shows that roughly 270 fern species found in south India, about 10 percent of the region. Fern flora occupies the forest floor, on tree trunks and branches, in the niche of rock.

The ferns had an important role in folklore medicine. These plants have been successfully used in the different systems of medicines like Ayurvedic, Unani, Homeopathic and other systems of medicines. Kirtikar *et al*. (1935) have described 27 species of ferns having varied medicinal uses. Chopra *et al.* (1956) have included 44 species and Nadkarni (1954) recorded 11 species of Pteridophytes having medicinal importance. Nayar (1959) recorded 29 medicinal ferns. May (1978) published a detailed review of the various uses of ferns and listed 105 medicinal ferns. In a recent compilation, Singh (1999) reported 160 species of useful Pteridophytes in India on the basis of phytochemical, pharmacological and ethnobotanical studies.

A systematic survey of the antibiotic activity of Pteridophytes, however has been scarcely undertaken. The antimicrobial potential of some ferns has been studied (Kumar and Kaushik, 1999; Parihar and Bohra, 2002a & b, 2003). With this background experiments were done to assess the antibacterial activities of certain ferns.

Out of 1,000 species of Pteridophytes occurring in India, 170 species have been found to be used as food, flavor, dye, medicine, bio-fertilizers, oil, fiber and bio-gas production (Manickam and Irudayaraj, 1992). The medicinal value of Pteridophytes against bacteria, fungi, virus, cancer rheumatism, diabetes, inflammation, consultant, fertility, diuretic, pesticides, heptoprotective, and sedative had been reported. Besides sugar, starch, proteins and amino acids, ferns contain a variety of alkaloids, glycosides, flavonoids, terpenoids, sterols, phenols sesquitorpens etc. as potential components used in various industries (Kulandairaj and John de Britto, 2000).

In comparison to higher plants they have found little applications in medicine. The tribal communities, ethic groups and folklore throughout the world are utilizing their plant parts like rhizome, stem, fronds, pinnae and spore in various way for the treatment of various ailments since ancient time.

The number of contributors about the taxonomy, ecology and distribution of Pteridophytes have been published from time to time but enough attention has not been paid towards their useful aspects. An attempt has been made to explore indigenous and ethnomedicinally important Pteridophytes and properly document their useful aspects.

Exploration on DNA binding ability of heteroleptic ligand metal complexes: Synthesis and characterization

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Abstract - Two heteroleptic ligand metallointercalators (Cu(II) and Zn(II)) have been synthesized using Knoevenagel condensate β-diketone ligand (obtained by the condensation of acetylacetone and cinnamaldehyde) as primary ligand and 1,10-phenanthroline as co-ligand in order to find out whether there is an enhancement in the efficacy of biological activities. They have been characterized by elemental analysis, magnetic susceptibility, molar conductance measurements, UV-Vis., FT IR and ^{13}NMR spectral studies. These complexes show higher molar conductance values, supporting their electrolytic nature. Spectroscopic and other analytical data of the complexes suggest square planar geometry around the central metal ion. The binding properties of these complexes with DNA have been explored by electronic absorption spectra. It reveals that the complexes have the ability to interact with calf thymus DNA (CT DNA) by intercalative mode. The binding constant values (Kb) clearly signify that the copper(II) complex have more intercalating ability than zinc(II) complex. The *in vitro* antibacterial and antifungal assay indicates that these complexes are good antimicrobial agents against various pathogens. It has been investigated by Minimum Inhibitory Concentration (MIC) method.

Keywords:

1. INTRODUCTION

Several ligands derived from β-diketones are also known to form metal complexes. These ligands derived from β-diketones have been employed for the preparation of new complexes. The β-diketone ligands are considered as potential ligands due to their enolising ability. β-diketone and its metal complexes have been widely used in diverse areas because of their unique structural features, chemical functionalities, and toughness for light and heat as electroluminescence materials [1]. β-diketone derivatives possess a broad spectrum of biological effects such as antiinflammatory and antimicrobial activity effects [2,3]. But being incapable of enolisation, the condensates have not perhaps been considered earlier as potential ligands towards transition metal ions.

Nowadays, special attention has been paid for the synthesis of effective conjugative and versatile chelating systems with metal ions due to their novel structural features, unusual redox behaviour and relevance to biological processes [4]. Amongst various systems, the coumpounds derived from Knoevenagel condensate ligand have gained much interest due to their delocalized π-orbitals, flexible behaviour, multifunctional ligand sites *etc*. In order to form the higher degree of conjugated versatile ligand system, Knoevenagel condensate ligand is designed for the formation of stable complexes. Studies of these structure, spectral and redox properties would be optimum models for the metalloproteins, which are essential to address the structure–redox relationship [5].

Keeping the facts in mind, herein the synthesis and characterization of Cu(II) and Zn(II) metal complexes containing Knoevenagal condensate ligand and 1,10-phenanthroline (heteroleptic ligand complexes) are described. These complexes have been characterized by physicochemical and various spectral techniques. Their DNA binding analysis has been carried out *via* electronic absorption titration method. Further, all the synthesized compounds were screened for their *in vitro* antimicrobial activity against various bacterial and fungal strains.

2. EXPERIMENTAL PROTOCOLS

2.1 Materials and Methods

The chemicals involved in this work were of AnalaR grade and were used without further purification. However, the solvents were purified by the standard procedure. Acetylacetone, cinnmaldehyde and 1,10-

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Fabrication of novel surface plasmon resonance induced visible light driven iridium decorated SnO_2 nanorods for degradation of organic contaminants

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Facile fabrication of visible light-driven CeO_2/PMMA thin film photocatalyst for degradation of CR and MO dyes

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Volume 44, pages 5223–5240, (2018) Cite this article

P. Latha, K. Prakash & S. Karuthapandian

Abstract

CeO_2/PMMA NCTF was successfully fabricated by a facile, room-temperature, inexpensive, and simple solution casting method. Ultra-violet, Fourier-transform infrared spectroscopy, X-ray diffraction spectroscopy, scanning electron microscopy, energy dispersive X-ray spectroscopy, transmission electron microscopy and X-ray photoelectron spectroscopy techniques have been used to scrutinize the structure and properties of CeO_2/PMMA NCTF. It has been found that the CeO_2 nanocubes are constantly dispersed into the PMMA matrix thus forming a thin film. Due to its unique structure, the CeO_2/PMMA NCTF has enhanced activity and selectivity towards the visible light-driven degradation of various organic pollutants. The photocatalytic degradation efficiency of the catalyst was tested against Congo red and methyl orange, selected as model organic contaminants. The synergistic effect of the catalyst reduces the electron–hole recombination rate and thus enhances the photocatalytic activity. Hydroxyl radical and super oxide radical ion species induce the photocatalysis which can be determined by trapping experiments. The synthesized CeO_2/PMMA NCTF can be reused several times without loss of activity, and a plausible mechanism was also proposed. It is hoped that our present effort may inspire further studies in new, efficient, recyclable photocatalysts and the degradation of organic contaminants driven by visible light.

Factors Influencing Customer Retention in Kanchipuram Hotel Industry

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Abstract - In a country like India, having a huge size of population, services sector has its huge potential. Development of services sector can transform the burden of large size of manpower into an asset by its proper utilizations and thereby can generate a huge size of income for the nation as a whole. The Indian tourism and hospitality industry has materialized as one of the key drivers of growth among the services sectors in India. Without the tourism industry there would be no hospitality industry and without the hospitality industry the tourism industry would have a large gap. Due to the large gap, there would be no fixed place for tourists to stay and there is a decreasing trend to travel the particular area. So it creates tourism activities such as tours, excursions and tourist attractions. Tourism contributes to 6.23 percent to the National GDP and 8.78 percent of the total employment in the country for the year 2016. Constant transformation, functional growth and improving standards have gained the hospitality industry of India approval all over the world. Among this hotel industry is a highly flourishing, lucrative and competitive market. To compete in such a market, the hotels should focus on maintaining good relations with the customers and in satisfying the customers. Customer retention refers to the ability of a company or product to retain its customers over some specified period. Customer retention is an important factor in today's increasingly tourism competitive markets which should be concerned seriously. The aim of this study is to empirically explore the factors influencing on customer retention in the hotel industry. A simple random sampling method was adopted to collect data from the study of kanchipuram district and the analysis of the influencing factors based on the integrated research approach for the hotel industry. A company's ability to attract and retain new customers is related not only to its product or services, but also to the way it services its existing customers, the value the customers actually generate as a result of utilizing the solutions, and the reputation it creates within and across the marketplace.

Keywords: Customer Retention, hotel industry, Technology factor, Cost factor, service factor, customer retention factor and loyalty factor.

1. INTRODUCTION

Among the service sector, hotel industry is an important service industry in India. Excellent customer service is vitally important in the hospitality industry. The hospitality industry is a broad category of fields within service industry that includes lodging, event planning, theme parks, transportation, cruise line, and additional fields within the tourism industry. The hospitality industry is a multibillion-dollar industry that depends on the availability of leisure time and disposable income. A hospitality unit such as a restaurant, hotel, or an amusement park consists of multiple groups such as facility maintenance and direct operations such as servers, housekeepers, porters, kitchen workers, bartenders, management, marketing, human resources etc. (Service Sector in India 2014).

The hotel industry is highly competitive and the right knowledge about customer values and demands is essential to differentiate from competitors and gain sustainable competitive advantage. Implementing traditional marketing strategies is often no longer enough to achieve this goal. Relationship marketing has increasingly become more important, as this concept suggests more focus on retaining the customer and creating a win- win situation with a long-term perspective (Oscar H. Pedraza Rendón, Rubén Molina Martínez, María S. Ramírez Flores). In traditional marketing there is more focus on acquisition. Most importantly a good balance between acquisition and retention directed to the right segments is essential for future success. The hotel business is rapidly developing due to growing demand for such services as well as the growing opportunities for travel. As a result, hotels face demanding customers, since the requirements for quality grow with an increased use of hotels' services, in order to increase the competitive ability of a hotel, the issue of customer loyalty is also important. Some of the characteristics of the successful activity of the business organisation are presentation and

Financial Literacy at Household Level among Women in Vizianagaram Town

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Abstract : In our country, where poverty and unemployment are the major problems, it is very crucial to financially literate the women to fuel the engine of growth by providing opportunities to women to contribute to economic growth. There are instances of extreme poverty reported by women post the death of the earning member of the family. However, such instances could have been avoided with future financial planning, contingency savings and emergency funds. Sometimes, women are aware of such products but are reluctant to go for such options because of poor and incomplete information or lack of personal confidence. While women in developed countries proved to be better financial planners relatively, it is the women of emerging economies who have to become literate when it comes to money management issues. In the patriarchal society like our India, male hold primary power and predominant in every role. Women were not given chance to involve in financial matters even they do not try to know their opinions also. Though women are now reaching heights as the sky is the limit, in family or household they themselves limits to parents, in-laws', spouses. In contemporary development planning people participation in the central theme for economic progress initiatives. This paradigm shift calls for considerable efforts to mobilize human energies and building up community based leadership at grass roots level. In this context, financial literacy is formed very effective to realize the goal of comprehensive empowerment of households. The research paper attempts to look at the status of women in India from ancient times and need of financial literacy among women. The objective of this research paper to identify the level of financial literacy among home-makers and working women. The aim of the primary research to understand the level of financial literacy among these two groups of women. The results of survey indicated that levels of financial literacy among home-makers comparatively lower than that of working women. The target audience has been randomly chosen in Vizianagaram town.

IndexTerms **- Financial literacy, women, home-makers**.

I. INTRODUCTION

In contemporary development planning people participation in the central theme for economic progress initiatives. This paradigm shift calls for considerable efforts to mobilize human energies and building up community based leadership at grass roots level. In this context, financial literacy is formed very effective to realize the goal of comprehensive empowerment of households. Financial Literacy means the capability to make effective decisions regarding the use of money. A financially literate individual is able to make intellectual judgments and take effective choices regarding the usage and management of money (Noctor et al., 1992). It is very encouraging to see that today women are at par with men in all fields but when it comes to financial decision-making, they are still dependent on the male members of their family. In our country, where poverty and unemployment are the major problems, it is very crucial to financially literate the women to fuel the engine of growth by providing opportunities to women to contribute to economic growth. There are instances of extreme poverty reported by women post the death of the earning member of the family. However, such instances could have been avoided with future financial planning, contingency savings and emergency funds. Sometimes, women are aware of such products but are reluctant to go for such options because of poor and incomplete information or lack of personal confidence. While women in developed countries proved to be better financial planners relatively, it is the women of emerging economies who have to become literate when it comes to money management issues.

Financial literacy involves both concept and application and these two ends are tough to bring together in reality. It means that people should not only know the financial planning concepts but should be capable of applying them in their day-to-day transactions. The investment and financial planning remains a weak point of Indian woman, despite of being highly educated and working at good positions. The concept of financial literacy has various parameters like basic money management, financial planning and savings, investments, budget etc. According to an annual Master card index prepared for measuring financial literacy, "India is at the bottom among 16 countries in Asia-pacific region in terms of overall financial literacy."

There are many definitions of financial literacy, for example, OECD defines financial literacy as "A combination of awareness, knowledge, skill, attitude and behavior necessary to make sound financial decisions and ultimately achieve individual financial wellbeing."

OECD INFE (2011) Measuring Financial Literacy: Core Questionnaire in *Measuring Financial Literacy: Questionnaire and Guidance Notes for conducting an Internationally Comparable Survey of Financial literacy.* Paris: OECD.

To measure the level of financial knowledge and attitude of respondents and assessing their behaviours with regard to finances, it is very important to identify the potential needs and gaps related to the specific aspects of financial literacy.

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Food and Literature Across the Ages

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In literature many writers registered cruelty of hunger in their works. Food is one of the basic components for the functioning of everyone in this world. It is the duty of a ruler to provide basic essential to the people of a nation. Many children die due to lack of nutrition. Many countries in the world suffer with extreme forms of hunger, especially Somalia like countries are suffer much due to hunger and people are being exploited. Every nation has its own unique food culture, but hunger is common for all. Many Tamil writers discuss about hunger in their writings. Among them Ovaiyar Tamil poet is very vividly expressed it in the following manner in her Nalvali:

> Honor, class, learning, strength, wisdom, sense of charity, austerity, aspirations, perseverance, desired of women of sweet talk all these ten will vanish once is confront with hunger. (Nalvali26)

Through her words one can know the nature of hunger well. In Hungry mood one cannot listen to anything, cannot do anything, in his life. Extreme hunger leads to many problems. In her text 'The Room of One's Own' text Virginia Woolf states the plight of hungry as: "One cannot think well, love well, sleep well, if one has not dined well" (Woolf ..)

Mahatma Gandhi, the father of our nation also observes the importance of food, he states that food is very important. It is like God for the needy, where he say: "There are people in the world so hungry, that God cannot appear to them except in the form of bread" (Ganthi 62).

The Poet Subramaniya Bharadhi asserted responsibilities of a nation in providing a proper shelter and food for its people. Thus, he vey boldly asserted people's right to throw away the failing rule in the following manner and showed himself as a radical fighter who voiced for the sake of his nation. "If there is no food for an individual let us destroy the entire universe" (Bharathiyar 45)

In Manimekalai, the sequel to Cilapathikara of Illangovadikal, Saththanar depicts the myth of Manimekalai, the daughter of Madhavi of Silapathikaram. She gives 'Amutha Surabhi'

Growth and Performance of Micro Small Medium Enterprises in Virudhunagar District

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Abstract - The Micro, Small & Medium enterprises (MSMEs) has often been termed as 'engine of growth' for all developing economies including India. MSMEs have been playing a momentous role in economic development of a country like India where millions of people are unemployed or underemployed and facing the problems caused by poverty. MSMEs occupy a position of prominence in Indian economy as they provide immediate large-scale employment, with lower investments and prove to be a second largest manpower employer, after agriculture. The significant growth of MSMEs has been taken place over a period of time. This sector is the major donor to gross domestic product (GDP), employment and exports in Indian economy. The main aims of the present study are growth, performance and problems faced by MSMEs in Virudhunagar District. This study is primarily based on secondary data collected from various secondary sources such as magazines, annual reports, District Industries Center and Department of MSMEs. This study upshots that though micro enterprises have registered good progress in terms of number of units, investment and employment opportunities, their performance is challenged by Lack of availability of adequate and timely credit, Procurement of raw material at a competitive cost, Inadequate infrastructure facilities.

Keywords: MSME, Growth, Performance, Problems

1. INTRODUCTION

The Micro, Small and Medium enterprises (MSMEs) have been accepted as the engine of economic growth for promoting equitable development of countries all over the world. The Micro, Small and Medium enterprises of India are a key driving force for the growth of Indian Economy. These MSMEs not only provide the employment opportunities but also facilitates the process of industrialization in rural areas. Simultaneously it enables the reduction of the unequal income distribution of wealth among the residents of a place. The MSMEs contribute significantly in the development of Indian economy through export promotion, domestic protection, low investment requirements, operational flexibility, technology adoption and so on. The SMEs are complimentary to large industries operating in the economy and contribute significantly in the fast development of the country. On an average this sector has almost 36 million units that provide employment to about 80 million individuals. This sector, through the production of 6000 products, contributes 8% to GDP of the country. It contributes 45% of the total manufacturing output and 40% of the total exports of the country. This research paper discusses the methodology, objectives, definition of MSME, year wise growth of MSME, block-wise performance of micro, small and medium enterprises in terms of employment creation and investment, product wise growth of MSME and challenges faced by the MSMEs in Virudhunagar District.

2. METHODOLOGY

The research paper is based on the formal analysis made using secondary data collected from various secondary sources such as magazines, annual reports, District Industries Center and Department of MSMEs. A review of notable previous researches undertaken related to the field of study is presented below.

Ghatak, Shambhu, in his paper titled "Micro, small and medium enterprises (MSMEs) in India: an Appraisal" highlighted that status of Indian MSMEs is better than its counterpart in Bangladesh & Pakistan. About 36% of Pakistani SMEs have bank accounts where as about 46% Bangladeshi's SMEs have Bank accounts. In comparison to them about 95% of Indian SMEs have their bank accounts. He further stated that Indian Govt. should accelerate its initiatives to provide further support to these Small scale industries.

A BEHAVIOURIAL STUDY ON PSYCHOLOGICAL STRESS MANAGEMENT IN WATER SCARCITY BACKDROP

Dr.P.Bharathi

ABSTRACT

Water is essential for our survival. Fetching water is the prime responsibilities for every woman in every household. They have to walk for miles in searching and fetching of water. Along with their multiple responsibilities they have satisfy the household water demand. It is an unwritten fate that women must do this job irrespective of her physical and mental illness. Collection of water is a painful journey especially in dry areas. Water scarcity effect on perceived stress, worry and negative emotions. Apart from physical pain in collecting water women also suffer from emotional stress of managing little water. Women tend to ones using and managing water in the home day to day. Women play a major role in domestic water management. The present study aims to examine the stress as it relates to water scarcity and the way they manage.

Keywords: Water, Stress, Scarcity.

Section I Introduction:

Water is essential for our survival. Women are responsible for finding a resource to their families needs to survive for drinking, cooking, sanitation and hygiene. Women tend to ones using and managing water in the home day to day. Today around the world WOMEN will spend 200 million hours for collecting water. Fetching of water is the prime responsibilities for women in every household. They have to walk for miles in searching and fetching of water. It is an unwritten fate that women's must do this job irrespective of her physical and mental illness. Collecting water is a painful journey especially in dry areas.

With the increasing threat of climate change water scarcity will become a burning issue. Inadequate access to water is linked to psychological stress especially among women. When access to water is altered it can profoundly impact the psychological well being of women i.e., it increase the risk of developing mental disorders. The entire burden of providing and management of water for the family create great pressure on physical and mental health of women.

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Heavy Metal Analysis of *Oreochromis Mossambicus* using Atomic Adsorption Spectroscopy

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Abstract

The present study to evaluate the bioaccumulation, of *Oreochromis mossambicus* reared with heavy metals concentration viz; Ni, Pb, and Cd fed with different protein diets D1 (40%), D2 (45%), D3 (50%) and D4 (55%) for 14 days. The fish was exposed to Ni, Pb and Cd at different sub lethal concentration of 6.2, 7.2 and 8.3 mg/l twice a day after a feed was given. The heavy metals of Ni, Pb and Cd were assayed after 14 days by using Atomic Adsorption Spectrophotometry and the results were given. The overall heavy metal bio-accumulation of *O. mossambicus* was reported. Certain tissue morphological difference was observed due to metal exposure. In the gill region high accumulation of (3103.47) Cd were observed in (high conc.) of 9.3 mg/l fed with 55% diet, whereas low accumulation of 543.43 were observed in Ni (low conc.) of 6.2 mg/l fed with 45% diet. Likewise muscle, ovaries low and high accumulation were observed. The order of heavy metal accumulation in the region of Gills was Cd > Pb, and Ni and followed by Muscle Cd, > Pb and Ni and Ovary Pb, > Ni and Cd than followed by control diet of 40% protein diets. The results were statistically significant at $p<0.05$.The accumulation of Nickel, Lead and Cadmium was significantly high where compared with control diet (40%) of fish tissues were reported.

Keywords: Heavy metals, different diets, bio-accumulation of gills, muscle, ovary

Introduction

In the last decades, contamination of aquatic systems by heavy metals has become a global problem. Heavy metals may enter aquatic systems from different natural and anthropogenic (human activities) sources, including industrial or domestic waste water, application of pesticides and inorganic fertilizers, storm runoff, leaching from landfills, shipping and

Impact of Annealing Time on Structural and Optical Properties of TiO_2 Thin Films Deposited by Spray Pyrolysis Technique

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Abstract - Titanium dioxide (TiO_2) thin films were prepared by Spray Pyrolysis technique on microscopic glass substrates at 350 ºC and 400 ºC with annealing time of 1 hour and 2 hours. The structural study was analyzed by XRD technique, which shows that all the TiO_2 thin films were of anatase phase and nanocrystalline in nature. The absorbance measured using UV-Vis spectroscopic method have notable shift to the lower wavelength region with increase in annealing time. The optical band gap value calculated from Tauc's plot was found to increase with increase in annealing time. The PL study showed emission peaks in visible region attributed to the impurities, defects and oxygen vacancy. The prepared TiO_2 thin films reveal that the annealing time has impact on the structural and optical properties.

Keywords: TiO_2 thin films, Spray Pyrolysis, Annealing time, XRD, UV, PL

1.INTRODUCTION

TiO_2 have been investigated widely and used in many applications due to its good crystalline structure, particle size, surface area, chemical stability, non-toxicity and low cost [1] TiO_2 thin films were synthesized by various methods including Spin coating method, Spray pyrolysis technique, RF-magnetron sputtering, Pulsed Laser Deposition (PLD), Chemical bath deposition etc.,[2]. Among these Spray Pyrolysis method is a simple and low-cost technique which has the capability to produce large area, high quality adherent films of uniform thickness [3].

Thin film properties highly depend on the various parameters involved in the preparation technique and processing factor. Annealing is a heat treatment that alters the physical and chemical properties of the material. It involves heating a material above its recrystallization temperature, maintaining a suitable temperature for a suitable amount of time and then cooling [4].

In the present work TiO_2 thin films were synthesized on glass substrates using Spray pyrolysis technique and the effect of annealing time on the structural and optical properties of the TiO_2 thin films was analyzed.

2. METHODS AND TECHNOLOGY

The Precursor solution was prepared using titanium tetra isopropoxide (TTIP, Sigma Aldrich, 97%), ethanol (AR, 99.9%) and acetyl acetone (AcAc, $CH_3COCH_2COCH_3$, Spectrum, 98%) by the following method. Ethanol was mixed with TTIP in a well cleaned beaker and the mixture was stirred using magnetic stirrer for 10 minutes. Then AcAc was added to this mixture for stabilizing the solution and stirred for 10 minutes. Again ethanol was added to this solution and vigorously stirred for 1 hour. Here the proportion of TTIP, ethanol and AcAc was maintained as 1:10:1 ratio.

Well cleaned microscopic glass slide was placed on the metallic plate and prepared TiO_2 solution was atomized into the Spray unit. TiO_2 solution was sprayed for 1 minute to the glass slide and then the film was annealed at 350 ºC for 10 minutes. Again the solution was sprayed for 1 minute after that the film was annealed at 500 ºC for 1 hour. To analyze the effect of annealing time another sample was prepared which was annealed for 2 hours. The same procedure was followed for coating of the TiO_2 thin films with substrate temperature of 400 ºC and annealing time of 1 hour and 2 hours. The TiO_2 thin films were deposited under the following conditions: Nozzle to substrate distance = 15Cm; Spray deposition rate = 4ml/min; carrier gas = air; carrier gas pressure = 1 bar, Substrate temperature = 350 ºC, 400 ºC.

In silico and *in vitro* studies of transition metal complexes derived from curcumin–isoniazid Schiff base

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Abstract

A series of transition metal complexes have been synthesized from biologically active curcumin and isoniazid Schiff base. They are characterized by various spectral techniques like UV-Vis, Fourier transform infrared (FT-IR), nuclear magnetic resonance (NMR), electron paramagnetic resonance (EPR) and mass spectroscopies. Moreover, elemental analysis, magnetic susceptibility and molar conductivity measurements are also carried out. All these data evidence that the metal complexes acquire square planar except zinc(II) which adopts a tetrahedral geometry, and they are non-electrolytic in nature. Groove mode of binding between the calf thymus DNA (CT DNA) and metal complexes is confirmed by electronic absorption titration, viscosity and cyclic voltammetry studies. In addition to that, all the metal complexes are able to cleave pUC 19 DNA. Optimized geometry and ground-state electronic structure calculations of all the synthesized compounds are established out by density functional theory (DFT) using B3LYP method which theoretically reveals that copper(II) complex explores higher stability and higher biological accessibility. This is experimentally corroborated by antimicrobial studies. *In silico* Absorption, Distribution, Metabolism, Excretion (ADME) studies reveal the biological potential of all synthesized complexes, and also biological activity of the ligand is predicted by PASS online biological activity prediction software. Molecular docking studies are also carried out to confirm the groove mode of binding and receptor-complex interactions.

Keywords: DFT calculation; Isoniazid; antimicrobial; groove binding; in silico ADME; molecular docking.

LITERATURE AND MORALITY IN THE SELECT WORKS OF ANNE TYLER AND GEORGE ORWELL

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Abstract

Morality is implicitly challenged in Literature. Both Anne Tyler and George Orwell evince great interest in the subject literature and morality. Literature presents reality, not just a mirror image. It goes beyond to highlight the complexities of human existence and the moral voice remains a steady, consistent factor. The vision of moral world has entered the human beings and became a part of their dreams and aspirations. A true art is moral. It seeks to improve life, not to debase it. Great Literature has a clear moral base. Moral vision has to be conveyed in the right form. Both used their intellectual powers to make their moral concerns appealing to the modern sensibility.

Anne Tyler is one of the most prominent women writers among the contemporary Southern novelists in America. Tyler is regarded as one of the best novelists in contemporary literature. She is known for her quiet, subtle fiction that explores complex, dysfunctional family relationships and individuals' search for meaning and identity in a changing world. The fiction of Anne Tyler is both unique and extraordinary in contemporary American literature. It is unique because Tyler sounds like no one except herself in spite of admitted influence of other writers. And it is extraordinary for her calm indifference to prevailing literary fashions; she believes in her own difference which sets her work apart from that of the others.

Tyler's fiction invariably focuses on how a character lives and how he or she does indeed connect with the people that are near. It is indeed her ability to produce fiction that takes into account the wealth of enigmas surrounding every human being that makes her a significant American novelist. After all these interlocking lives that travel out into space on daring tangents are the stuff of fiction, as they are indeed the stuff of life – southern or otherwise.

Morality is an essential, innate aspect of the human struggle which is a vital component of life. Religious text such as the Bible argues that moral purity is an important part of why humankind exists in the first place. Most of the American search for a life – style that centres on the ethical and the moral issues in an attempt to counter the prevailing commercial aspirations. Among the basic principles of Quakerism is the spiritual experience called the 'Inward light'. Everyman receives this light, whether he is a christian or not. The light manifests the love and grace of God toward all mankind. The Quaker's sense of inner oneness with the living Lord rejected the mediation of the priesthood between God and Man. They expected uncompromising honesty, simplicity of life, non-violence and justice from the followers. They were against slavery in America. They argued on moral issues and believed in single standard of conduct before God and man. They did not believe Sunday as the Lord's Day because they believed that every day was Lord's Day. They did not believe in Christmas because they thought that Christ is present in every living being. Friends opposed the church and their authority as they thought that it is not necessary to engage religious instruction. Thus Friends guided by the dictates of Inner Light, Produced men of strong, straight and serious temperament. With their spiritual ideals Quakers made a considerable impact on American life. Instead of pursuing the American dream of economic and social success, the Tylers led lives far more centered on ethical and moral issues and problems. Tyler traces her characters with great love and compassion. Her avoidance of violence is a unique feature for the peace – loving Quakers.

MARRIAGE AND FAMILY IN SHOBHA DE'S *SECOND THOUGHTS* – A SOCIAL PERSPECTIVE

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Introduction

Every religious tradition and culture encourages marriage as a responsible adult act. Marriage is regarded as a duty incumbent upon all. In some cultures marriage is considered more crucial for women than for men. It is the most important social and religious occasion in a person's life. Even in a society where celibacy is a religious virtue, it is expected that to become a celibate ascetic one has to first experience marriage and parenthood. And it has been an important social institution. It is the basis for the family. The functions of marriage include regulation of sexual behaviour, reproduction, nurturance, protection of children, socialization, consumption and passing on the race.

Shobha de, the Indian woman novelist, whose novels show the struggle of woman against the predatory male-dominated society. In dealing with the problems of women in the androcentric society, she fails to provide viable solutions to the plight of the ailing woman. A woman in Indian society marries not just the man but also his family and subsequently loses her identity in marriage, relinquishes her freedom and sets about pleasing everybody.

Her novel **Second Thoughts** is a realistic representation of the psyche of the traditional Indian men and women. It deals with a young middle-class Bengali girl, born and bred in Calcutta who makes an arranged matrimony alliance with a Bombay-based, foreign-returned Bengali. Maya, the young bride is more fascinated and in love with Bombay than at the prospect of having married Ranjan. Once she lands in Bombay, after the marriage, her disillusionment begins. She realizes that despite Ranjan's stay abroad, he is very traditional and above all, an insensitive husband. After marriage, Maya, with lots of dream, visits Bombay, with her husband Ranjan. For every girls, marriage ushers glamour, fascination, and freedom but once the ceremony is over, the dreams come crashing down and it is with a lot of bitterness that they face the harsher unknown realities. Maya was fascinated by "Bombay but was taken aback when she sensed that Bombay smelt of desperation and deceit". Desperation and deceit become the key words of her life when she becomes a part of Bombay.

Both Maya and Ranjan are strongly influenced by the traditional orthodoxy of their respective parents. Ranjan has studied abroad, lived in Bombay, but as far as his wife is concerned he imposes restrictions on her movements, she is not free to go anywhere in the city. She cannot feel free to live in the house as she would wish to. He imposes many restrictions to her. He asks her to stay at home and not to misuse his hard earned money in things like the "gajra of mogras" (26). He frights her against mop salesmen and vendors by mentioning them as "Useless ruffians". For this reason, he also asks her not to peep through the windows of the house. He never appreciates her for any work, dress, word or any other thing which belongs to her. His attitude towards Maya is derogatory and says to accept what he was saying because he does not like any kind of argument.

Ranjan's mother Mrs. Malik is rich and apparently seems quite modern and start. She has a very clear picture of her future daughter-in-law. Maya is often hurt by Ranjan's indifferent attitude and wonders why he did not pick up a Bengali girl from Bombay. She was an influential lady and she could have chosen for

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Molecular dynamics simulation approach to explore atomistic molecular mechanism of peroxidase activity of apoptotic cytochrome *c* mutants

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ABSTRACT

Mutations in cytochrome *c* (Cyt *c*) have been reported in tuning peroxidase activity, which in-turn cause Cyt *c* release from mitochondria and early apoptosis. However, the molecular tuning mechanism underlying this activity remains elusive. Herein, multiple 20 ns molecular dynamics (MD) simulations of wild type (WT), Y67F and K72W mutated Cyt *c* in aqueous solutions have been carried out to study how the changes in structural features alters the peroxidase activity of the protein. MD simulation results indicate that Y67F mutation caused, (i) increased distances between critical electron-transfer residues, (ii) higher fluctuations in omega loops, and (iii) weakening of intraprotein hydrogen bonds result in open conformation at heme crevice loop in Cyt *c* leading to an enhanced peroxidase activity. Interestingly, the aforementioned structural features are strengthened in K72W compared to WT and Y67F, which triggers K72W mutated Cyt *c* into a poor peroxidase. Essential dynamics results unveil that first two eigenvectors are responsible for overall motions of WT, Y67F and K72W mutated Cyt *c*. This study thus provides atomic level insight into molecular mechanism of peroxidase activity of Cyt *c*, which will help in designing novel Cyt *c* structures that is more desirable than natural Cyt *c* for biomedical and industrial processes.

1. Introduction

Computational studies have provided significant insights concerning the details of molecular motion. Last decade witnessed the shifting of structure-function paradigm to structure-dynamics-function triad, to investigate the dynamic behavior of biomolecules on different timescale along with the accurate knowledge of tertiary or quaternary structure to understand the protein function [1]. In addition to its well established role as an electron carrier, cytochrome *c* (Cyt *c*), the hemoprotein, has attracted increasing interest recently, because of its essential role in the peroxidase activity and early apoptosis [2,3]. The Cyt *c* mediated apoptogenic pathway is important for a large variety of biological events, including brain development, immune system homeostasis, genotoxic-induced cell death and consequently, playing essential role in protecting living organisms from diseases such as cancer [4–9]. Disruptions in the apoptosis regulation can lead to numerous pathologies, including neurodegenerative disorders, autoimmunity and cancer [1,2]. Apoptosis is executed by activation of subfamily of cysteine proteases known as caspases. In mammalian cells, a major caspase activation pathway is the Cyt *c* initiated pathway. After its release into the cytosol, Cyt *c* interacts with apoptotic protease activating factor-1 (Apaf-1), which then binds to pro-caspase-9 to create a protein complex known as apoptosome [10,11]. The apoptosome cleaves the pro-caspase to its active form, caspase-9, which in turn induces cell death through a series of biochemical reactions. Post-translational modifications such as tyrosine nitration, phosphorylation, methionine sulfoxidation and mutations

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Money and Marriage in Edith Wharton's *The House of Mirth*

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Abstract: The present paper discusses two prominent features of Edith Wharton's fiction as Wharton has carefully portrayed in her fist and most famous novel *The House of Fame*. They are marriage and money. Money and marriage have played a definite and decisive role in Edith Wharton's life. This autobiographical touch has infused into her novel a characteristic fervour and significance that are personally interesting and creatively luminous. They bring before the readers a vivid picture of her bubbling, bright youth and of how the fashionable New York society of her times has flourished fastening itself on financial prosperity and prominence and proper marital status and connections of men and women.

Key Words: money, marriage, aristocracy, societal

Edith Wharton (1862-1937) is one of the famous American Women Novelists whose contribution to American literature is exemplarily significant. She was born Edith Newbold Jones in 1962. As she was born in an aristocratic family, it was not easy for her to take up the profession of writing. There were social restrictions and inhibitions. The society looked upon the practice of art as mean and undignified. As Candace and Clare Colquitt put it, "Edith Wharton, born Edith Newbold Jones in 1862, entered into the careful and closed ranks of the New York aristocracy, defied the limitations of a society that did not condone the practice of art for men and women, and for over forty years seized her life through writing" (537).

Edith Wharton's passion for reading and writing did not diminish "though as a young girl, she had been explicitly forbidden to read novels" (Waid 539). Wharton has displayed her expertise in visual arts like painting, sculpture, architecture and gardening but she is popularly known and acclaimed for her fiction. She is the author of twenty-two books – novels and novellas and nearly a hundred short stories. Among her novellas, *Ethan Frome* (1911) and *Summer*(1917) have redefined much attention and acclaim. Of her novels, the best known and appreciated are *The House of Mirth* (1905), *The Reef* (1912), *The Custom of the Country* (1913) and *The Age of Innocence*. She also wrote poems at the age of sixteen and her early poems were published in the Atlantic and New York newspaper. The reader can come across passages and descriptions in her novels which reveal her inherent poetic imagination and power.

Wharton belonged to the closed ranks of the New York aristocracy and she was very well aware of the customs of the elite. Her novel *The House of Mirth* develops a critique of American society at the beginning of the twentieth century. In *Mirth* Wharton focuses her attention mostly on two themes –money and marriage. Money is the be-all, end-all symbol to most of the characters in the novel. Wharton depicts the upper-class society which is built on money. Marriage, one may say, is one important and imperative stage in a woman's life strongly recommended and advocated for the fulfilment of a women's life by the society. Eileen Connell, commenting on the theme of marriage, remarks: "Wharton explores some of the disastrous consequences of a marriage institution that is founded on spurious notions of a woman's place in society" (558).

Lily Bart is the protagonist of the novel *The House of Mirth*. Wharton has portrayed her heroine as a beautiful young woman of twenty-nine years old. Lily is a well-born and well-educated. Wharton unveils a part of Lily's past and details about her wealthy family are presented. Wharton describes Lily in such a way that one can notice her own presence as a representation of a wealthy life:

> As she moved beside him, with her long light step, Selden was conscious of taking a luxurious pleasure in her nearness: in the modeling of her little ear, the crisp upward wave of her hair – was it ever so slightly

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MORPHO-ANATOMICAL, HISTOCHEMICAL, PHYSICO-CHEMICAL AND THIN LAYER CHROMATOGRAPHY ANALYSIS ON *Annona muricata* L. SEEDS

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ABSTRACT

Annona muricata L. belongs to the family annonaceae commonly called as soursop, is an interesting plant known for its edible fleshy fruit resembling *Annona squamosa*. Fruits and seeds of A. *muricata* are used in the folk medicine for treatment of various diseases. The fruit is known to possess anti-cancer properties and it is believed that consumption of the fruit may prevent cancer. In present investigation, the anatomical structure, histochemical localization of storage chemicals, physicochemical analysis, powder drug analysis and thin layer chromatography were performed on the mature seed. The anatomical structure shows the presence of multilayered seed coat with three different layers of testa namely exo, meso and endo testa, the tegmen is found to be collapsed. The rumination extends into the endosperm and idioblast cells are seen on the either side of thick walled rumination. Histochemical staining revealed that the endosperm is rich in lipids and proteins. Idioblast cells show positive colouration with different stains and reagent indicating the presence of various biochemical substances like alkaloids, lipids. Physicochemical analysis results, especially extractive values show that the seed is rich in phytochemicals. Powder drug and fluorescence analysis revealed the potential chemical properties of seed powder for evaluation as drug. Thin layer chromatography result indicated the presence of phenolic substances.

KEYWORDS: *Annona muricata* L. seeds, Morpho-anatomical, Histochemical, Physico-chemical, Thin Layer Chromatography.

INTRODUCTION

Annona muricata L. belongs to the family Annonaceae, commonly known as Soursop. *Annona muricata* L. is the important medicinal plant which shows many medicinal properties

Fruit of *Annona muricata* L.

Fruit is dark green, prickly (or bristled) fruits are egg-shaped and can be up to 30 centimetres (12 inch) long, with a moderately firm texture. Pulp is juicy, acidic, whitish, aromatic and possess abundant seeds. The creamy and delectable flesh of the fruit consists of 80% water, 1% protein, 18% carbohydrates and fair amount of vitamins B and C, potassium and dietary fiber (PIER, 2008). The average weight of 1000 fresh seeds is 470 grams and had an average oil content of 24%. When dried for 3 days in 60 C (140F) the average seed weight was 322 grams and were tolerant of the moisture extraction; showing no problems for long-term storage under reasonable conditions (Royal Botanical Garden, 2005). Stephens (1936), Corner (1952), Martinez (1952) and studied the variations in the fruit size and shape of *Annona muricata* and stated that the soursops are more or less oval or heart-shaped, sometimes irregular, lopsided or curved due to improper carpel development or insect injury. The fruit is compound and covered with a reticulated, leathery-appearing but tender, inedible, bitter skin from which protrude few or many stubby or more elongated and curved, soft, pliable, spines. The tips break off easily when the fruit is fully ripe. The skin of the immature fruit is usually dark-green, becoming slightly yellowish-green (Zayas, 1944).

MATERIALS AND METHODS

Source of the seeds: Mature ripen fruits of *Annona muricata* L. were purchased from the Koyambedu fruit market, Chennai. Seeds were removed from the ripen fruits, air-dried, stored in the refrigerator and used for this investigation.

Morpho-anatomical Studies: The seed was macroscopically examined for its organo-leptic

Title

Non-Isolated Resolving Number for Some Splitting Graphs.

Authors

Avadayappan, Selvam; Bhuvaneshwari, M.; Chitra, P. Jeya Bala

Abstract

Let G be a connected graph. Let W = {w1,w2, ...,wk} be a subset of V with an order imposed on it. For any vertex v ∈ V, the vector r(v|W) = (d(v,w1), d(v,w2), ..., d(v,wk)) is called the metric representation of v with respect to W. If distinct vertices in V have distinct metric representation, then W is called a resolving set of G. The minimum cardinality of a resolving set of G is called the metric dimension of G and it is denoted by dim(G). A resolving set W is called a non-isolated resolving set if the induced sub graph hWi has no isolated vertices. The minimum cardinality of a non-isolated resolving set of G is called the non-isolated resolving number of G and is denoted by nr(G). In this paper, we determine the non-isolated resolving number for the splitting graph of some standard graphs.

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Paddle wheel manganese carboxylate metal organic frame work as a host for hydrophilic molecules

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Passionate Preference and Purchase Behaviour of Pasteurized Milk products in Virudhunagar District

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Abstract

Milk is an essential commodity in the life of Indian consumers. They prefer healthy and energy drinks for consumption. The main challenge for marketers is, to create the consumer loyalty by quality, freshness, odour and taste. Marketers need to know the consumers response towards their own brand milk and dairy product of its availability, acceptability and affordability.

Today, almost all the people are consuming milk and milk products. Brand preferences of the rural and urban consumers are differ. Some buyers are totally brand loyal, buying only one brand in a product group. Most of the buyers switch over to other brands. A lot of brands of milk products are available in the market. But the consumers prefer a particular brand which is much affordable to them. In the modern business world, due to the development of science and technology, many new brands have been introduced in different technical term wise classification of products in the market every year. The present study has been taken to find out the Brand Preference of Packed Milk among Rural and Urban Consumers.

Keywords: Packed Milk, Pasteurized milk, Consumer behavior.

Introduction

Today's marketer is keen to closely monitor the changes, especially to keep regular track of the changing pattern of consumer's aspirations and competitive actions. Any business success ultimately depends on what consumers choose to do. With a rising awareness of brands, the discerning buyer is choosier. Studies on Consumer behaviour have become increasingly important as the consumers are becoming more heterogeneous and discerning. A firm must understand the buyer the buyer behaviour, his/her preference in favour of one brand or product, what motivates him or her to select a brand or product and who influences him or her to buy the brand or product.

Milk is an indispensable item of consumption for human beings. Man and milk animal lived in proximity and their relationship dates back to the origin of civilisation. Prior to urbanisation, the usual practice was to consume milk in its fresh form or after simple processing. The extra milk was converted into short-term conserved products or puddings that were consumed in a phased and leisurely

PREDICTIVE ANALYSIS OF THE FACTORS THAT INFLUENCE CUSTOMERS' PREFERENCE FOR ONLINE PLATFORMS WHILE BUYING INSURANCE POLICY

A Indira, R Neelamegam

ABSTRACT

In the era of fast and digitalised world, to cope up with the swift changes in the financial services sector, the insurance sector is undergoing a paradigm shift. Traditionally, insurance products were sold through an agent, broker or at branches of a bank. Insurance Regulatory and Development Authority (IRDA) regulations, changes in the client's expectations and buying behaviour, services offered by web aggregators, the emergence of a variety of products offered by insurance start-ups, technological advancements, and internet facilities brought many changes in the business of insurance sales. A customer can avail insurance service directly from the insurance company's digital portals in few minutes with a few clicks, round the clock and, through simplified forms. Customer acquisition and retention are the critical aspects for any business irrespective of the changes in the business model. Understanding and fulfilling the customer requirements in the digital distribution model of insurance is essential in the era of insurance porting. So, the present research work is made to identify the factors influencing the customers to opt for the digital platform for insurance purchase. Further it is imperative to examine the extent of influence of the factors in determining the satisfaction with the usage of the digital platform.

KEYWORDS

Online insurance, Influencing factors, Digital platforms, Factor analysis, and Predictive analysis.

Applied Organometallic Chemistry

FULL PAPER

Probing of effective pyrazolone based metallonucleases: Molecular docking and *in vitro* biological critiques

Alagarraj Arunadevi, Rajakkani Paulpandiyan, Natarajan Raman

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Abstract

Four novel tryptophan based metal (II) complexes of the type [ML $(Try)_2$] were prepared by using pyrazolone derived Schiff base ligand. The proposed structure was confirmed by physicochemical methods which reveal octahedral coordination environment around the metal center. Intercalative binding mode of the complexes with CT DNA was confirmed by electronic absorption titration, viscosity measurements and fluorescence spectroscopy. Efficiency of DNA cleavage ability of the metal complexes was explored by the gel electrophoresis technique. The antimicrobial activities of the metal complexes showed potent biocidal activity. The percentage of free radical scavenging activity shows that the complexes are very reactive towards DPPH. Moreover, their cytotoxicity was tested against the two cancer cell lines (MCF-7 and HepG2) and one normal cell line (NHDF) respectively. The MTT assay shows that the complexes have the anticancer efficacy. Moreover, the complexes exhibit a limited cytotoxicity effect on normal cell line NHDF. The morphological changes of apoptosis cell death were investigated by using Hoechst 33258 staining method. In addition, the Molecular docking studies was executed to consider the nature of binding and binding affinity of the synthesized compounds with DNA (PDB: 1BNA) and protein (PDB: 3hb5).

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Probing the potency of triazole tethered Schiff base complexes and the effect of substituents on their biological attributes

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Affiliations + expand

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Abstract

Two triazole-derived Schiff base ligands and their eight octahedral metal(II) complexes were designed and synthesized. They were characterized by elemental analysis and various spectroscopic techniques. The compounds were evaluated for their DNA binding tendencies with Calf thymus DNA. The concentration dependent chemical nuclease activity was also explored with supercoiled pBR322 DNA. The in vitro antimicrobial screening was undertaken which showed similar activity to the DNA binding studies. Complex 5 revealed exceptional DNA binding affinity, cleaving propensity and antimicrobial efficacy though all the complexes showed activity. All copper(II) complexes were evaluated for their antiproliferative activity against a panel of human cancer cell lines. Complexes 1 and 5 showed activity against all the cell lines with low toxicity towards normal cell line. The effect of substituents on the ligand system of the complexes is also discussed along with the importance of tuning the ligand system.

Keywords: Cytotoxicity; DNA interactions; Triazole analogues.

Title

Radial Radio Sequence of a Graph.

Authors

Avadayappan, Selvam; Bhuvaneshwari, M.; Vimalajenifer, S.

Abstract

Let G(V (G),E(G)) be a graph. A radial radio labeling, f, of a connected graph G is an assignment of positive integers to the vertices satisfying the following condition: $d(u, v) + |f(u) - f(v)| \geq 1 + r(G)$, for any two distinct vertices $u, v \in V(G)$, where d(u, v) and r(G) denote the distance between the vertices u and v and the radius of the graph G, respectively. The span of a radial radio labeling f is the largest integer in the range of f and is denoted by span(f). The radial radio number of G, rr(G), is the minimum span taken over all radial radio labelings of G. The sequence $(\mu 1(v))_{v \in V(G)}$ arranged in decreasing order is called the $(\mu 1(v))$ - rr sequence of G, where $(\mu 1(v))$ is the radial radio number of the induced subgraph induced by the closed neighborhood of v in V (G). In this paper, we present some results on the $(\mu 1(v))$ - rr sequence of a graph.

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Rational construction of novel rose petals-like yttrium molybdate nanosheets: A Janus catalyst for the detection and degradation of cardioselective β-blocker agent acebutolol

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Recent trends in electrochemical biosensors of superoxide dismutases

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Rose – Coloured Glasses as the Legacy and a Beacon Light in Danielle Steel's *Winners*

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Abstract
Danielle Steel's mission is to convey a message which could sustain life and invigorate moral fibre of man for all ages. In Winners she explores a meaning of life through the delineation of her Protagonist perennially caught in dynamism and incessant struggle. Having a firm faith in human potential and dignity, Lily Thomas, her father Bill, and Dr.Jessie Matthews assert that man is an extra ordinary creation of God, gifted with a boundless energy, a soul, a spirit capable of endurance. Danielle Steel contends that the real self of man gets bloomed when he encounters the antagonistic forces of this world. Man, today is at the crossroads of confusion. Danielle Steel's first step towards her aim of encountering existential problems is to accept reality as it is. So she has been acknowledged as an outstanding artist who made a successful attempt to adduce such principles of life as may make human beings assert their 'self'. Therefore, it becomes clear that it is he/she who, with a disillusioned attitude proceeds to evolve new values which enlightened the self of man. Action emerges from self – Consciousness, which is an innate quality. The novel Winner has been spun out of the fabrics of this perennial philosophy; and this acts as a healing balm on the jaded spirit broken man of our day.
Keywords: optimism, existentialism, survivors, courage and triumph

All great artists have a theme, an idea of life profoundly felt and founded in some personal and compelling experience. This theme then finds confirmation and development in new intuition. The development of the great writer is the development of his/her theme – the theme is part of his/her and has become the cast of his/her mind and character. True to this assertion, Danielle Steel has a clear and comprehensive idea of the world, a philosophical doctrine, which constitutes her theme and forms the basis of all the novels she has written. Danielle Steel is not contented merely with the discovery of the theme of the creative freedom of the mind; she fully explores it and presents it in its wholeness. The various ideas of life, expressed in her novels, are only the corollaries of her concept of the creative freedom of the imagination; they have no independent existence of their own. Let us examine some of these ideas of life to show how she has explored her theme thoroughly in all its aspects.

Inexhaustible vigor is the conspicuous feature of the life portrayed in her novel. Her world is; no doubt, replete with vitality, but vitality is the result of the working of the creative imagination in man. As mentioned above, Danielle Steel holds that man's creative freedom of the mind gives him a vision of life, which is so important for him that he strains every nerve to attain it. People in her novel are replete with vigor because they madly strive, throughout their lives, to materialize their visions and beliefs. Thus, it can be said that human vitality is only an essential aspect of her principal theme of the creative freedom of the imagination.

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Shifting Identities in Nadine Grdimer's the *Pickup*

Abstract

Nadine Gordimer who has garnered a well-established place among white African writers is a towering figure of the Global Literature. One may discern the aspect of globalization in Nadine Gordimer's post-apartheid novel *The Pickup*. Identity is one of the prominent and opt- repeated themes of Gordimer's novels. In The Pickup Gordimer chooses to deal with the issues of displacement, alienation, immigration and identity and lifts these problems from a local or national to a global level. This novel addresses the theme of identity that assumes significance in the twenty-first century with its greater emphasis on globalization. This paper thus analyzes shifting identities in *The Pickup* which is first set against the backdrop of post-apartheid South Africa and then against an unnamed Arabic village background.

Keywords: Shifting identities, displacement, culture, immigration, globalization

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Simple sonochemical synthesis of novel grass-like vanadium disulfide: A viable non-enzymatic electrochemical sensor for the detection of hydrogen peroxide

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ABSTRACT

Design and fabrication of novel inorganic nanomaterials for the low-level detection of food preservative chemicals significant is of interest to the researchers. In the present work, we have developed a novel grass-like vanadium disulfide (GL-VS_2) through a simple sonochemical method without surfactants or templates. As-prepared VS_2 was used as an electrocatalyst for reduction of hydrogen peroxide (H_2O_2). The crystalline nature, surface morphology, elemental compositions and binding energy of the as-prepared VS_2 were analyzed by X-ray diffraction, Raman spectroscopy, field-emission scanning electron microscopy, energy-dispersive X-ray spectroscopy and X-ray photoelectron spectroscopy. The electrochemical studies show that the GL-VS_2 modified glassy carbon electrode (GL-VS_2/GCE) has a superior electrocatalytic activity and lower-reduction potential than the response observed for unmodified GCE. Furthermore, the GL-VS_2/GCE displayed a wide linear response range (0.1–260 μM), high sensitivity (0.23 $\mu A\,\mu M^{-1}\,cm^{-2}$), lower detection limit (26 nM) and excellent selectivity for detection of H_2O_2. The fabricated GL-VS_2/GCE showed excellent practical ability for detection of H_2O_2 in milk and urine samples, revealing the real-time practical applicability of the sensor in food contaminants.

1. Introduction

Hydrogen peroxide (H_2O_2) is an important chemical oxidizer, has been widely used in pharmaceutical and industrial applications [1]. In addition to oxidizing properties, it also has excellent antibacterial properties and has been widely used as a food preservative in milk, cheeses, pharmaceutical, medical sterilizations, and paper bleaching [2]. H_2O_2 has played an important role in biological process and human metabolism [3,4]. The higher concentration of H_2O_2 can cause diverse effects includes skin diseases, diabetic vasculopathy, asthma, atherosclerosis, inflammatory arthritis, osteoporosis, neurodegenerative diseases, cancer and Alzheimer's disease [5,6]. Therefore, the accurate detection of H_2O_2 is of interest to the biological and pharmaceutical fields. Till date, various analytical methods such as chromatography, titrimetry, spectrometry, and fluorometry have been developed for the sensitive detection of H_2O_2 [7]. Compared to available methods, the electrochemical techniques offered many advantages for detection of H_2O_2 such as fast response, easy fabrication, higher sensitivity, low-cost and portability [8–10].

Over the past decades, inorganic nanostructured materials are found tremendous interest due to their unique physicochemical properties [11]. In particular, transition metal dichalcogenides (TMDCs; AS_2, A = Mo, W and V etc.,) has possess similar properties to graphene such as excellent chemical, physical, optical, mechanical, magnetic and electrical properties. The unique properties that enable them to use in diverse fields including electro-catalysis, Li-ion batteries, photoelectric devices, and energy storage applications [12–16]. Among different metal dichalcogenides, vanadium disulfide (VS_2) is an interesting material, has been widely used in supercapacitors, Li-ion batteries, moisture responsiveness, intercalation, hydrogen evaluation reactions, spintronics and field emitters. It also has interesting properties such as high specific surface area, intrinsic ferromagnetism, and good mechanical properties [17–27]. Until now, numerous synthetic routes have been developed for the fabrication of nanostructured VS_2

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Study of Transition Metal Ddoped ZnO Nanostructures

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Abstract:- The grain size value of Ni doped ZnO thin films increases with the Ni concentration and it deteriorates the ZnO crystalline quality. The bandgap values of Ni doped ZnO thin films were found to decreases with increase in Ni concentration. The low reflectance and high value of index possessed by ZnO and Ni doped ZnO films are suitable for antireflection coatings. The Optical bandgap values obtained by single oscillator model for ZnO film exactly matches with the Tauc's plot values. The resistivity values of Ni doped ZnO films decreses with increase in Ni doping concentration.

Keywords:- *ZnO Nano Structures; Doping; XRD; Refractive Index; Resistivity.*

I. INTRODUCTION

Nanocrystalline ZnO is of distinct interest, because of the options for the alteration of various ZnO based nanostructures[1]. In recent years doped ZnO thin films have been the subject of much attention because of their potential for important applications such as a hetero junction device[2], luminescent material[3], gas sensor[4], transparent conductor[5] and dilute magnetic semiconductor[6]. By doping with different metal ions using different techniques can improve the properties of ZnO, particularly the electrical behavior. The isovalent nature of both ZnO and transition metal ions(TM) have made it possible to dope ZnO with Al [7], Ga, Co, Cd[8,9,10], Mg [11] and Ni. Only very few studies has been carried out on ZnO:Ni system due to the phase segregation of ZnO and NiO. This happens due to the large driving force of Ni-O bond as compared to Zn-O bond [12].

Various methods have been used to prepare transition metal doped ZnO such as chemical vapour deposition(CVD), pulsed laser deposition(PLD) and sol gel process, The sol–gel process presents some noticeable advantages, such as; a wide possibility of varying the material properties by changing the composition of the starting solution [1,14], easy to obtain nanoscale materials in volume of gram and its low cost. In the present work, sol- gel spin coating process was used to deposit Ni-doped ZnO films on glass substrate. The variation in structural, optical and electrical properties of Ni doped ZnO film with change in Ni doping concentration has been investigated.

II. EXPERIMENTAL METHOD

Ni^{2+} doping (1,2 and 3 wt%) with ZnO was achieved by dissolving nickel acetatete tetrahydrate ($Ni(CH_3COO)_2.4H_2O$) (in wt%) in a mixture of zinc acetate dihydrate ($Zn(CH_3COO)_2.2H_2O$) and 2-methoxyethanol. The monoethanolamine(MEA) was added as a stabilizer and the solution was mixed together in a round-bottom flask by stirring at room temperature for 15 minute. The obtained clear solution was heated at 60˚C upon magnetic stirring for 60 minute and left undisturbed for 12 hours. The clear and homogenous solution obtained was used as the coating solution for film preparation. The Ni doped ZnO thin film was coated by sol-gel spin coating method at 4000rpm spin rate for 30 seconds by using a spin coater on glass substrate. The film was prepared with 7 coatings with drying at 300˚C for 15 minute after each coating. Finally the film on the glass substrate was annealed at 500˚C for 60 minute in order to obtain the Ni doped ZnO thin films. In this method three ZnO:Ni samples were prepared by varying nickel acetate tetrahydrate concentration as 1 wt%,2 wt% and 3 wt%.

III. RESULTS AND DISCUSSION

A. X-ray Diffraction Study

Figure 1 shows the XRD patterns of undoped ZnO and Ni doped ZnO thin films. From Figure 1 it can be seen that all the films are polycrystalline in nature and have a preferential c-axis orientation along the (002) direction.The intensity of the (002) peak of the 1 wt% Ni doped ZnO film is very low compared to the undoped sample and the (002) peak intensity increases with increase in Ni doping concentration as 2wt% and 3wt%.

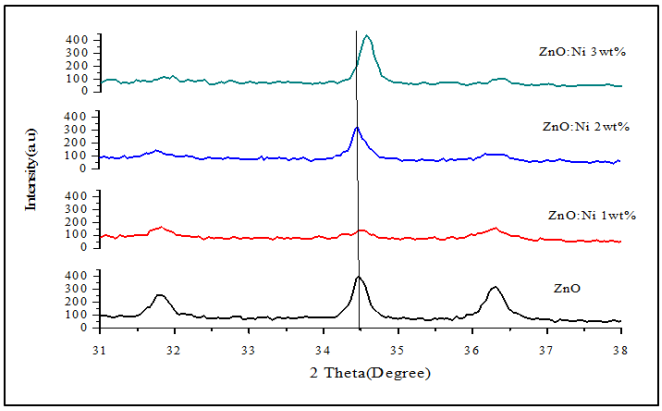

Fig 1:- XRD pattern of ZnO and Ni doped ZnO thin films

Support Independence in Graphs

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Abstract

In any graph G, the support of a vertex is defined as the sum of degrees of its neighbours. A graph G is said to be balanced, if every vertex of G has same support. G is called highly unbalanced when no two vertices of G have same support. In this paper, we introduce the concept of support independence in graphs. A subset S of a vertex set is said to be support independent, if no two vertices in S are having same support. The support independence number of G is the cardinality of maximum support independent set in G. We obtain the support independence number of some standard graphs and derived graphs.

Keywords: *Splitting graphs, cosplitting graphs, Support of a vertex, Support independence.*

AMS Subject Classification Code (2010): 05C (Primary)

1 Introduction

Only finite, simple, undirected graphs are considered in this paper. We refer [7] for further notations and terminology.The degree of a vertex v is denoted by $d(v)$. A *full vertex* of G is a vertex which is adjacent to every other vertices of G.A graph G is said to be r – *regular*, if every vertex of G has degree r. $D(G)$denote the set of degrees of all vertices in G.

In a graph $G(V, E)$, for any vertex $v \in V$, the *open neighbourhood* of v is the set of all vertices adjacent to v. That is, $N(v) = \{u \in V(G) / uv \in E(G)\}$. The *closed neighbourhood* of v is defined by $N[v] = N(v) \cup \{v\}$. Clearly, if $N[u] = N[v]$, then u and v are adjacent and $d(u) = d(v)$.

The concept of support of a vertex has been introduced and studied by Selvam Avadayappan and G. Mahadevan [6]. The *supports(v)* of a vertex v is the sum of degrees of its neighbours. That is, $s(v) = \sum_{u \in N(v)} d(u)$. Note that the support of any vertex in an r – *regular* graph is r^2.

A graph G is said to be a *balanced graph*, if any two vertices in G have the same support. It is easy to observe that the complete bipartite graphs $K_{m,n}$ and any regular graphs are balanced graphs. A graph G is said to be *highly unbalanced*, if distinct vertices of G have distinct supports. For example, a highly unbalanced graph is shown in Figure 1.

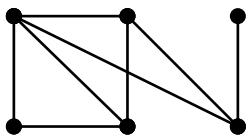

Figure 1

Synthesis and Antimicrobial Investigation of Transition Metal Complexes Having Tryptophan

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Abstract - A *n*ew family of four mixed ligand Cu(II), Ni(II), Co(II) and Zn(II) complexes of 2-amino-3-(1H-indol-3-yl)propanoic acid (L-tryptophan) incorporating benzaldehydes (Schiff base) and 2,2'-bipyridine have been synthesized and characterized. In view of *in vitro* biocidal activity observations of tryptophan derivative, there is an enhancement in the antimicrobial activity of the complexes when compared to that of ligand. A comparative study of the MIC values of the ligand and its complexes indicate that the copper(II) complex exhibits higher antibacterial/antifungal activity than the other compounds.

Keywords: Complex, Schiff base, Tryptophan, Antimicrobial activity.

1. INTRODUCTION

The chemistry of coordination compounds has always been a challenge to the inorganic chemists as it has more branches nowadays. Coordination compounds play a very significant role in our lives. The study of them has contributed to the highest degree of understanding the chemical bond in inorganic chemistry. Metals play an imperative role in an immense number of extensively differing biological processes[1-9]. Metal ion dependent processes are found throughout the life science and vary tremendously in their function and complexity. It is now appreciated that metal ions control a vast range of processes in biology. Many new and exciting developments in the field of biochemistry create interest out of inorganic chemists to court in the new area called “Bioinorganic Chemistry”.

Schiff bases have been playing an important part in the development of coordination chemistry[11]. Schiff base metal complexes have been studied extensively because of their attractive chemical and physical properties and their wide range of applications in numerous scientific areas[12]. These types of complexes have been vigorously explored in recent years and such studies have been the subject of many papers and reviews. The most popular metal analogues on the market today are those that contain platinum and ruthenium. Other metal analogues containing copper, nickel, cobalt and zinc are still under development.

Amino acids are key precursors for synthesis of hormones and low-molecular weight nitrogenous substances with each having enormous biological importance. The presence of amino acids also enables vitamins and minerals to perform all their important functions. Without these essential amino acids, the human body is unable to function normally and in some extreme cases, cause death. Tryptophan, a precursor of serotonin and melatonin, plays an important role in health and disease and its deficiency may underlie many types of brain disease such as quality of sleep and disturbance in sleep mediated by melatonin. It is a natural relaxant.

Antimicrobial resistance is fast becoming a global concern with rapid increase in multidrug-resistant bacteria[13-15]. Throughout history, there has been a continual battle between humans and the multitude of microorganisms that cause infection and disease. Many of the crude drugs, which are the sources of medicinal preparations, still originate from wild growing plants. However, the plant based drugs have shortened the life span of the source of material. There is a continuous search for more potent and cheaper raw materials to feed the industry. So, nowadays pharmaceutical industries are looking for synthesizing the alternative compounds which act as drugs. During the past decades, much attention has been given to the synthesis of new metal complexes and the

Synthesis and Characterization of 1D-MoO_3 Nanorods Using *Abutilon indicum* Extract for the Photoreduction of Hexavalent Chromium

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Abstract

In this present work, we report a novel green synthesis of MoO_3 nanorods (NRs) utilizing *Abutilon Indicum* (*A. Indicum*) plant extract, containing palmitric, linoleic, linolinic acids and their derivatives which might be acting as both reducing and stabilizing agents. The synthesized catalyst has been employed to reduce toxic Cr(VI) to Cr(III) in the aqueous solution which was continuously monitored by UV–Vis absorbance spectroscopy. The structural, optical and morphological characterizations are performed using PXRD, UV-DRS, PL, FESEM, TEM, FT-IR and EDAX. The optical properties were precisely investigated by calculating the Tauc's relation. The band gap of as synthesized MoO_3 was found to be 2.57 eV (483 nm) which falls under visible region, thus catalyst can be activated under solar light which could be cost effective. Biologically synthesized MoO_3 NRs showed highest activity, i.e., almost 99% toward reduction of Cr(VI) under solar light. In addition to this, the photo firmness and reusability test showed that the catalyst can be reused upto five cycles without waning its activity.

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Topical Perspectives

Temperature-dependent conformational dynamics of cytochrome *c*: Implications in apoptosis

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The Othering in Yoginder Sikand's *Beyond the Border*

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Abstract
The problem of 'othering' secures a prominent place in the twenty- first century which is facing myriad challenges such as territorial disputes, sectarian violence, military conflicts, etc., The world is torn with global, national and regional conflicts based on group-based difference. 'Othering', which leads to marginality, can occur on a group basis or sometimes at the individual level where people are likely to experience the discomfort of being in some place or with people where they do not feel the sense of belonging. Also the idea of 'othering' is central to sociological analyses of how majority and minority identities are constructed. Hence it is essential to explore the conditions under which the processes of 'othering' seem to arise which results in specific group-based identities and how these identities become institutionally embedded. Yoginder Sikand's travelogue Beyond the Border is based on his journey to Pakistan in which he explores the ground level situation of Pakistan society, culture and people. He vividly brings out the socio, cultural and religious aspects of Pakistan where people find themselves in an environment of 'othering' and how they cope up with the situation. Sikand, to some extent, tries to dispel the myths about Pakistan as the terrible 'other' that have filtered into the Indian psyche. The book offers valuable insights into the prevalent mindsets in both countries. This paper focusses on the forces that contribute to 'othering' and the possible interventions that might mitigate some of the problems arising out of 'othering'.
Keywords: othering, nationalism, secessionism, assimilation, identity, inclusion, belongingness

Twenty–first century is facing myriad challenges among which the problem of 'othering' secures a prominent place. The world is severed with global, national and regional conflicts due to group-based difference. The terrorist attacks or the attack on the 'other' shows the lack of cultural and geographic integration of ethnic and racial groups and the persistence of discrimination. This paper investigates some of the reasons behind 'othering'. First, it explores the conditions under which the processes of 'othering' seem to arise which results in specific group–based identities and how these identities become institutionally ingrained. Finally the paper examines the responses to 'othering' and the possibility of bringing solutions to this perennial problem.

The term 'othering' includes a set of common processes and conditions that result in group-based inequality and marginality. It can be defined as a set of processes and structures that engender marginality and inequality is based on group–identities. The 'othering' can include religion, sex, race, ethnicity, socio–economic status, disability, etc., It also includes territorial disputes and military conflicts. Group–based identities are central to these conflicts which are based on religion, ethnicity, cultural, geographic and political histories.

Theoretical Screening and Selection of Functional Monomers for Molecular Imprinted Electropolymer as Sensor for Glutamate

Authors: Karthikeyan, Murugesan; Rajkumar, Raju; Kumar, Marimuthu Dhinesh; Balamurugan, Murugesan; Muthukumar, Kaliappan; Karunakaran, Chandran

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Abstract | References | Citations | Supplementary Data | Suggestions

Neurotransmitter glutamate excess release caused overstimulation of brain called excitotoxicity resulting in cell death, ischemic stroke and certain neurodegenerative diseases viz., epilepsy, amyotrophic lateral sclerosis, Alzheimer's, and Parkinson's disease. Using molecular imprinted polymer as synthetic receptor, we can develop functional MIP with predetermined selectivity for various templates especially for neurotransmitters. It relies largely on the molecular recognition through the functional monomer and template interactions. So, a theoretical model for suitable selection of functional monomer for synthesizing molecular imprinting electropolymers (MIPs), with specific recognition for detection of glutamate, a key neurotransmitter involved in neuronal diseases is attempted. Here, the density functional (DFT) method with the hybrid B3LYP exchange-correlation functional has been applied to investigate the intermolecular interactions between glutamate and several functional monomers viz., pyrrole, 3,4-ethylenedioxythiophene (EDOT), o-phenylenediamine (o-PD), thiophene, aniline and 3-aminophenyl boronic acid (3-APBA) most commonly used in the preparation of conducting MIPs. The most stable configurations of the glutamate, functional monomers and complexes formed were considered for analysis. The geometrical, vibrational and NMR chemical shift parameters involving hydrogen bonding sites of the most stable interacting systems have been analysed. Our results illustrate that, among the different glutamate/monomer molecular systems considered, the binding energies between glutamate and functional monomers are in the order, 3-APBA > pyrrole > aniline > o-PD > thiophene > EDOT. The stronger binding interactions of 3-APBA suggests it as an efficient monomer for selective functional MIP based sensors for glutamate.

Keywords: BINDING ENERGY; DENSITY FUNCTIONAL THEORY; H-BONDING INTERACTION; MOLECULAR IMPRINTED ELECTROPOLYMER; NEUROTRANSMITTER

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Utilization of digital resources by the postgraduate students of Zoology in VHNSN College, Virudhunagar, India

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Abstract

The main objective of this present study is to determine the usage of digital resources by postgraduate students of Zoology at VHNSN College, Virudhunagar, Tamilnadu, India. Data was generated using questionnaire to find out level of exposure and extent of use of digital resources. This study investigated the time used up, purpose, use of various e-resources, preferred search engine and benefit of e-resources.

Keywords: Digital resources, Postgraduate students, search engines.

Introduction

In the 21st century, information technology had brought quick changes in teaching World. The education is gradually moving towards digital. Digital resources have a lot of rewards over traditional resources. A lot of developments are witnessed in the recent years in online publishing. Scholars are paying attention to have easy access to full text publications and reference linking in a complex information space.

In the computer era, academic libraries and study centers have totally changed the information environment. Education institutions started subscribing to digital resources to meet the user's requirement and expectations (Mallikarjun N. Mulimani and Suresh B.Gudimani, 2008).

Utilization of Electronic Resources and its Impact: A study of National College of Engineering Library Users

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Abstract

In the digital era electronic resources are revolutionizing libraries across the world, Electronic resources in one of the emerging environment in engineering college library. The present study focuses utilization of e-resources and its impact: a study of national college of engineering, Maruthakulam, Tirunelveli, Tamilnadu. This study main objective are to identify, the awareness of e-resources, satisfaction level of availability of e-resources, use of different e-resources, purpose of use, satisfactory level of using e-resources, impact of e-resources, problem faced in the access of e-resources, users suggestion to improve usages of e-resources. Survey method was used to carry out this research. A well structure questionnaire was distributed among the faculty members and students to collect desired data. A total of 200 questionnaires was distributed and collected with sample of NCE.

Keywords

e-resources; e-journal; engineering college; library users

Electronic access

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INTRODUCTION

No doubt, the electronic resources may be probably viewed as one of the most significant happenings of the modern information society and academic institution. The 21st century transition to electronic resources crucial role in academic libraries is gaining momentum in the opening years. Every academic institution is purchasing electronic resources in record number for their users. The primary goal of library is to provide an effective combination of print, non-print and electronic resources to the users to meet their information requirements systematically. It is a fact that, the electronic resources available in libraries be used systematically and thoroughly where in educate the users from time to time. Out of all, the electronic resources are playing a vital role in information dissemination in contemporary librarianship.

ABOUT INSTITUTION

NCE College was established in the year 2000 under the Manarul Huda Trust, Thiruvananthapuram. The institute works with a mission to attain the goals enshrined in the vision of the college."To create Technologically Superior and Morally Strong Universal Manpower". NCE aspires to be an ISO 9001-2015 certified premier institution offering high quality education. The aim of the NCE library is to support teaching, learning, and research in institute. The library has more than 20,000 volumes with 4850 titles, 690 Number of back volume, 1314 digital resources, 1114 past student's project report, 420 subject e-books, DELNET e-database, online journals and NPTEL. The NCE library regularly purchases good number of books, subscribes a number of printed and electronic online journals, other study materials to cater to the needs of the users.

REVIEW OF LITERATURE

Biradar, Kavita and Naik, K. G. Jayarama (2017). The study focuses on the digital literacy skills and competencies among the research scholars and PG students of deemed university libraries in Bangalore. The study aims to identify the respondent's usage, awareness of e-resources, purpose of use, impact of e-resources, factors influenced and barriers faced in the access of e-resources. Questionnaire was used to collect the data from the respondents. The researcher took 130 questionnaires for analysis using simple percentage techniques. Mani, M. and Thirumagal, A. (2016). The present study examines the existence of types of e-resources, awareness on e-resources, Assess points of e-resources, problems faced while

Versatile, metal free and temperature-controlled g-C_3N_4 as a highly efficient and robust photocatalyst for the degradation of organic pollutants

Published: 15 November 2018

Volume 45, pages 1147–1167, (2019) Cite this article

Kasirajan Prakash, Puvaneswaran Senthil Kumar, Sekar Pandiaraj & Swaminathan Karuthapandian

Abstract

In the present study, we report novel graphitic carbon nitride (g-C_3N_4) nanosheets at different calcination temperatures viz 500 °C, 550 °C and 600 °C by the simple hydrothermal synthesis for photocatalytic degradation of organic contaminants. The crystal structure, optical properties, and surface morphology were studied by various tools such as X-ray diffraction, UV–visible spectroscopy, Fourier transform infrared spectroscopy, scanning electron microscopy and transmission electron microscopy analysis. The as-synthesized g-C_3N_4 nanosheets exhibited a hexagonal phase and had good crystallinity with a crystallite size of ~ 68 nm. The photodegradation efficiency of g-C_3N_4 nanosheets showed excellent photocatalytic activity towards RhB and CV dye solution, and the dye degraded within 70 and 60 min, respectively. The g-C_3N_4 @550 °C nanosheets showed superior photocatalytic activity due to the adsorption capability and delayed electron hole recombination rate. In addition, the photocatalytic mechanism and reusability test were also found by trapping experiments.

WORK LIFE BALANCE AMONG EMPLOYEES IN PRIVATE SECTOR BANKS WITH SPECIAL REFERENCE TO VIRUDHUNAGAR DISTRICT

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V. H. N. Senthikumara Nadar College,
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Research guide, Associate professor,
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ABSTRACT

Banking sector is an emerging sector in India, the entry of private sector has brought various essential changes in the banking industry. Now a day's managing work life balance is a challenge for both employers and employees particularly in service industry where employees are loaded with work at workplace and at the same time they have to balance their personal life. Work life and personal life are two sides of the same coin. Creating and managing a balance between the work and personal life is considered to be a work life balance issue. Increasing work pressure, globalization and technological advancement has an impact on balancing professional life and personal life.

Key words: Work-Life balance, Private banking sector, Personal Life, Professional Life.

I. INTRODUCTION

In the present working world, most of the time is spent by the employees in their organization leaving less time to take care of their personal and family needs. The increased amount of competition in any business, improvement in information technology, they require for speedy and quality services has taken considerable time of the workers, sometimes even after the working hours.

Work-life balance is the skill to manage balance between work and personal life and to stay productive and competitive at work while maintaining a happy, healthy home life with sufficient leisure, despite having work pressure and endless activities which require your time and attention. Work Life Balance can also be defined in a different manner where an employee tries to justify his most important priorities with employer according to his position, grade wrapped in accountability & being a part of family spend a good quality time apart from professional life, it suggests that professional life is a part of social life & never influenced each other if someone is willing to make happen such occurrence with a wise approach.

In present scenario managing the work life balance is a big challenge for Bank employees particularly in private banking sector. As banking sector is an emerging sector in India there are many private banks entered in the banking sector. The employees in banking sector have to face the customers and deliver their needs continuously. They have great pressure in employment and work load. The growing importance to performance of work, people finds it difficult to manage themselves with the family. Sometimes family issues of the employees lead to lose their performance in work. Nowadays, the people are recognized by their job. Work gives as status, money and self respect to lead a prosperous life in the society. On the other hand family is also important for our life and it is the strength of a person.

Work Life Balance in the Context of Time Management

S.Muthulakshmi and P.Sundara Pandian

Department of Commerce, V.H.N. Senthikumara Nadar College (Autonomous), Virudhunagar.

Abstract - Purpose : The paper considers the impact of work life balance in the context of time management To analyze the problems faced by the managerial women in managing their time. To know the satisfaction level of women managers in time management. To provide suggestions to manage their time in an effective manner. **Design/ methodology/ approach**: The paper is a empirical research on work life balance and Time Management. It involves women managers The overall aim of this study is to explore time pressures of managerial women with regard to their family and managerial roles in service sectors in Tamil Nadu. The study intends to portray the experiences of the women managers in their dual role performance. The study also seeks to examine suitable suggestions to manage their time in an efficient manner. **Findings:** It is argued that women managers face a difficult task in balancing their time. Thus it can concluded that managerial women strive hard to manage their time to effectively balance their work and life. **Practical Implications:** Deeply ingrained social assumptions about time management. The time based factors and the satisfaction level towards work life balance is examined. **Originality/ Value:** The paper moves forward the debate of work life balance in the context of time management. The managerial women must be self- motivated, follow and achieve effective time management.

Keywords: MSME, Growth, Performance, Problems

1. INTRODUCTION

The growing number of educated women in India - who are now participating in the urban, organized, industrial sector in technical, professional and managerial positions has been accompanied by the a steady growth in dual career families (Kommarraju 1997). Research on career women in India shows that work and family dilemmas are often different from those reported by women in the west (Sekaran 1986). As compared to their counterparts in other parts of the world, Indian employees face a lot of difficulties in managing their work and life.

The human resources approach to issues of life work balance various according to institutional sectors, individual organizational policies and historical practices. In most of the societies, work life conflict seems to be quite high in case of working women. Although men also face this challenge of balancing work and other priorities, it effects women more since they do most of the work associated with the household activities, apart from taking care of children, older family members and other dependents. Though multiple roles in work and family can be the source of multiple satisfaction for employed women. The centrality of family as an institution in the Indian culture is an important contextual note in this research (Carlson and Kacmar 2000). The family role structures and larger societal beliefs within this society can generate gender-based social pressures whereby men are expected to excel in their career and for women to be a good mother, good wife and good homemaker even if she is working in full employment.

2. TIME MANAGEMENT AND WORK-LIFE BALANCE

The greatest problem of a managerial woman is the time constraint to cope up with multiple activities. The problem of coping with multiple activities in a limited time has affected the managerial women personally because one have to stay late in office which amounts to a lot of physical strain as well as neglect home responsibilities. Women are affected professionally as it is difficult to finish projects on the given deadline because of the limited time available to them which causes stress. This leads to crashed expectation from the superiors as they expect a lot out of them. Therefore, managerial woman are constantly under pressure to prove them. Managing time better, therefore, implies a philosophy and a strategy to apportion equitable time for physical, mental, emotional, spiritual, familial, social and professional demands and responsibilities of life, and to get the best value of time through proper planning and prioritising.

Document details - Phytochemical Process for the Functionalization of Materials with Metal Nanoparticles: Current Trends and Future Perspectives

ChemistrySelect

Volume 3, Issue 48, 28 December 2018, Pages 13561-13585

Phytochemical Process for the Functionalization of Materials with Metal Nanoparticles: Current Trends and Future Perspectives(Review)

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Abstract

The bioreduction process, that utilizes the plant extracts, have been explored extensively as a green chemical route for the synthesis of metal nanoparticles due to their eco-friendly protocol as well as versatility in the selection of various plant resources. Recent advances in this plant extract mediated biological process are the fabrication of functional nanostructures. Bioreduction mechanism catalyzes the combining process of metal nanoparticles with other kind of materials including metal, metal oxides, cellulosic, zeolite and carbon nanomaterials. Integrating metal nanoparticles with various materials offers new functional properties and improves their performance comparing to their pristine counterpart. In this review, plant-based biochemical substances, which influence the metal ion into metal and their controlled nucleation on the surface of other kinds of materials are highlighted, and the future prospect of this bio-based synthesis of functional nanostructures are discussed. © 2018 Wiley-VCH Verlag GmbH & Co. KGaA, Weinheim

Author keywords

Bioreduction | Functional Materials | Metal Nanoparticles | Plant Extract

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Document Type: Review
Publisher: Wiley-Blackwell

Vivekanandhan, S.; Sustainable Materials and Nanotechnology Lab (SMNL), Department of Physics, V.H.N.S.N. College, Virudhunagar, Tamil Nadu, India;

SciVal Topic Prominence

Topic:

Prominence percentile:

Document details - Novel ginger-like morphology of barium molybdate: A promising electrocatalyst for the detection of neurotransmitter dopamine

International Journal of Electrochemical Science

Volume 13, Issue 11, 1 November 2018, Pages 10809-10820

Novel ginger-like morphology of barium molybdate: A promising electrocatalyst for the detection of neurotransmitter dopamine(Article)(Open Access)

Sundaresan, P., Chen, Y.C., Chen, S.-M., Chen, T.-W., Latha, P., Lou, B.-S.

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[c]Department of Chemistry, VHNSN College, Virudhunagar, Tamil Nadu, 626001, India

View additional affiliations

Abstract

In this work, we have report a novel electrochemical sensor for the selective detection of dopamine (DA) based on ginger-like morphology of barium molybdate (BaMoO4; BaM) modified screen printed carbon electrode (SPCE). The ginger-like BaM was prepared through a simple co-precipitation technique and its physiochemical properties were systematically investigated by various analytical and spectroscopic techniques such as X-ray diffraction (XRD), Raman, field emission-scanning electron microscopy (FE-SEM) and energy-dispersive X-ray spectroscopy (EDX). Furthermore, the as-prepared ginger-like BaM was effectively investigated for the sensitive and selective electrochemical determination of DA. The ginger-like BaM/SPCE shows a reversible electrochemical behavior with superior current response for DA detection. The BaM catalyst played a significant role to electrochemical detection of DA, as a results very low detection limit (0.021 μM), wide linear response range (0.1-266 μM), well sensitivity (0.35 $\mu A \mu M^{-1} cm^{-2}$) and good selectivity in the presence of common metal ions and biological compounds. This study provides a novel idea for the fabrication of binary metal oxides and their potential application in electrochemical sensor and biosensor. © 2018 The Authors.

Author keywords

Barium molybdate | Binary metal oxide | Dopamine | Electrochemical sensor | Ginger-like | Neurotransmitter

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Document Type: Article
Publisher: Electrochemical Science Group

Document details - Biochar supercapacitors: Recent developments in the materials and methods

Green and Sustainable Advanced Materials: Applications

23 October 2018, Pages 223-250

Biochar supercapacitors: Recent developments in the materials and methods (Book Chapter)

Vivekanandhan, S.

Sustainable Materials and Nanotechnology Lab (SMNL), Department of Physics, VHNSN College (Autonomous), Virudhunagar, Tamilnadu, India

Abstract

Biochar receives significant importance as it exhibits extensive scientific and technological potential in many fields with the added advantages of environmental restoration as a carbon sink. Traditionally, biochar has been explored for the soil amendment purposes with lower economic impacts, which hampered the viability of their industrial sectors. Thus, the value added uses of biochar have become essential, which lead to the exploration of their application potential in many industrial sectors including catalysis, water treatment, composite fabrication and energy storage and conversion. Among them, carbonaceous biochar has potential usage in electrochemical energy storage devices especially supercapacitors. Though, the usage of biochar in supercapacitors is in preliminary stage, significant research accomplishments have been devoted in recent years. As the demand for high performance supercapacitors made with sustainable materials expands exponentially, this chapter summarizes the recent developments on biochar-based supercapacitors. © 2018 Scrivener Publishing LLC.

Author keywords

Biochar Biomass Energy storage Pyrolysis Supercapacitor

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Document Type: Book Chapter
Publisher: wiley

Vivekanandhan, S.; Sustainable Materials and Nanotechnology Lab (SMNL), Department of Physics, VHNSN College (Autonomous), Virudhunagar, Tamilnadu, India;

Chapters in this book

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- Green sustainability, nanotechnology and advanced materials - a critical overview and a vision for the future
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- Valorization of green and sustainable advanced materials from a biomed perspective - potential applications
- Applications of textile materials using emerging sources and technology: A new perspective
- Nanotechnology and nanomaterials: Applications and environmental issues
- Chitosan in water purification technology
- Green and sustainable advanced materials - environmental applications
- Green and sustainable copper-based nanomaterials - an environmental perspective
- An excellence method on starch-based materials: A promising stage for environmental application
- Synthesized Cu2Zn1-xCdxSnS4 quinternary alloys nanostructures for optoelectronic applications
- Biochar supercapacitors: Recent developments in the materials and methods
- Nature and technoenergy
- Biomedical applications of synthetic and natural biodegradable polymers
- Efficiency of transition metals at nanoscale - as heterogeneous catalysts
- Applications of nanomaterials in agriculture and food industry

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supercapacitor applications: An investigation on the impact of acid washing and activation

(2024) Energy Storage

Kalla, A. , Mayilswamy, N. , Kandasubramanian, B.

Biochar: a sustainable and an eco-friendly material for energy storage applications

(2024) International Journal of Green Energy

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Document details - Synthesis of WO₃ nanorods and their photocatalytic degradation of organic contaminants

Rasayan Journal of Chemistry

Volume 11, Issue 4, October-December 2018, Article number RJC-3076/2018, Pages 1405-1414

Synthesis of WO_3 nanorods and their photocatalytic degradation of organic contaminants(Article)(Open Access)

Jeyapaul, T., Prakash, K., Harikengaram, S., Chellamani, A., Selvam, V.

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View additional affiliations

Abstract

In this present investigation, we report a novel tungsten trioxide (WO_3) nanorods were successfully synthesized by the simple hydrothermal environment. The as-synthesized rod-like WO_3 were characterized by various spectroscopic and analytical techniques such as X-ray diffraction (XRD) UV-vis spectroscopy analysis (UV-DRS). The structural morphology and their elements were confirmed by scanning electron microscopy (SEM) and energy-dispersive X-ray spectroscopy (EDX). It was found that the rod-like structure of WO_3 was successfully confirmed by transmission electron microscopy (TEM). The synthesized WO_3 exhibits an excellent photocatalytic activity which may be attributed to the improved charge separation and complete degradation of RhB dye solution within 70 min. The photocatalyst efficiency was further tested towards the effect of dye concentration and effect of different catalyst weight. The involvement of.OH in the photocatalytic reaction was evidenced using radical quenching experiment with employing different scavengers. A possible degradation mechanism was proposed for the semiconductors and possible reasons for the enhancement of visible-light photocatalytic efficiency were discussed. This study could provide a new approach to construct a novel photocatalysts and a promising candidate catalyst for poisonous wastewater treatment in the near future.

Author keywords

Hydrothermal | Photocatalyst | RhB dye | The mechanism | WO_3

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Selvam, V.; Department of Chemistry, The MDT Hindu College, Manonmaniam Sundaranar University, Tirunelveli, Tamil Nadu, India;

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Topic:

Prominence percentile:

Cited by 7 documents

Tao, Y. , Zhang, M. , Huang, D.

Photocatalytic degradation and mechanism of tetracycline by metal doped WO3 | 金属掺杂WO3光催化降解四环素性能及机理

(2023) Huanjing Kexue Xuebao/Acta Scientiae Circumstantiae

Shinde, P.H. , Padwal, Y. , Waghadkar, Y.

ZnS–MoS2 nano-heterostructure: efficient photocatalyst for dye removal under sunlight

(2023) Journal of Materials Science: Materials in Electronics

Shandilya, P. , Sambyal, S. , Sharma, R.

Properties, optimized morphologies, and advanced strategies for photocatalytic applications of WO3 based photocatalysts

(2022) Journal of Hazardous Materials

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Document details - Volume of precursor solution effect on the properties of SnO₂ thin films prepared by nebulized spray pyrolysis technique

Optical and Quantum Electronics

Volume 50, Issue 9, 1 September 2018, Article number 346

Volume of precursor solution effect on the properties of SnO_2 thin films prepared by nebulized spray pyrolysis technique(Article)

Palanichamy, S., Raj Mohamed, J., Satheesh Kumar, P.S., Pandiarajan, S., Amalraj, L.

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Abstract

Undoped SnO_2 thin films have been deposited on amorphous glass substrates with different precursor solution volume (10, 15, 20 and 25 ml) using simple and cost-effective nebulized spray pyrolysis technique. The influence of precursor solution on structural, optical, photoluminescence and electrical properties had been studied. The X-ray diffraction spectra prove the polycrystalline nature of SnO_2 with tetragonal structure. All the films show a preferred growth orientation along (110) diffraction plane. The average transmittance of SnO_2 thin films varied between 82 and 75% in the visible as well as IR region. The band gap energy decreases from 3.74 to 3.64 eV corresponding to direct transitions with the precursor solution volume had increased from 10 to 20 ml and then increased as 3.72 eV for 25 ml. SEM pictures demonstrated polyhedrons like grains. EDX confirmed the existence of Sn and O elements in all the prepared SnO_2 thin films. Photoluminescence spectra at room temperature revealed that the four emission bands in all the samples such as sharp dominant peak at 361 nm with shoulder peak at 377 nm (UV region), a broad and low intensity peak at 492 nm (blue region) and 519 nm (green region). The electrical parameters were examined by Hall effect measurements, which demonstrated that the film prepared at 20 ml precursor solution volume possess minimum resistivity 2.76×10^{-3} Ω-cm with activation energy 0.10 eV and maximum figure of merit 1.54×10^{-2} $(\Omega/sq)^{-1}$.

Author keywords

Activation energy | Band gap | Crystallite size | Nebulized spray pyrolysis | Tin oxide

Indexed keywords

Engineering controlled terms: Activation energy | Amorphous films | Amorphous materials | Cost effectiveness | Crystallite size | Energy gap | Film preparation | Photoluminescence | Solution mining | Spray pyrolysis | Substrates | Tin oxides

Engineering uncontrolled terms: Different precursors | Electrical parameter | Hall effect measurement | Nebulized spray pyrolysis | Photoluminescence spectrum | Precursor solutions | Tetragonal structure | X-ray diffraction spectrum

Engineering main heading: Thin films

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Publisher: Springer New York LLC

Amalraj, L.; Research Department of Physics, V.H.N.S.N. College, Virudhunagar, Tamilnadu, India;

Document details - Physical properties of nebulized spray pyrolysised SnO₂ thin films at different substrate temperature

Applied Physics A: Materials Science and Processing

Volume 124, Issue 9, 1 September 2018, Article number 643

Physical properties of nebulized spray pyrolysised SnO_2 thin films at different substrate temperature(Article)

Palanichamy, S., Mohamed, J.R., Kumar, P.S.S., Pandiarajan, S., Amalraj, L.

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[b]P.G. and Research Department of Physics, H.H. The Rajah's College, Pudukkottai, Tamilnadu 622001, India
[c]Department of Physics, Devanga Arts College, Aruppukottai, Tamilnadu 626101, India

Abstract

Using nebulized spray pyrolysis technique, we investigate tin oxide (SnO_2) thin films had been coated with different substrate temperature (300–500 °C) onto microscopic glass substrate. All the prepared films have tetragonal crystalline structure with preferential orientation (110) observed by X-ray diffraction analysis. The reduced strain due to the increase of substrate temperature from 300 to 450 °C increased the average crystalline size from 27.40 to 42.99 nm and then decreased further. All the films display high transmittance in the visible and also in IR region. As the substrate temperature had increased from 300 to 500 °C, the average transmittance of SnO_2 thin films varied between 79 and 90%. The energy band gap values had diminished from 3.91 to 3.75 eV by increasing the substrate temperature. The refractive index (n) of these films had increased from 2.11 to 2.32 with increase in substrate temperature from 300 to 450 °C and then decreased further. The optical static and high frequency dielectric constants (ε_o and ε_∞) have been determined as a role of substrate temperature. The surface morphology of these thin films exhibited polyhedron-shaped grains obtained by scanning electron microscope. Energy dispersive X-ray analysis proved the presence of Sn and O elements in the as-prepared SnO_2 films. Hall effect measurements shows that the film had deposited at 450 °C exhibited lowest resistivity 6.53×10^{-3} Ω cm and highest figure of merit 9.14×10^{-3} $(\Omega/sq)^{-1}$ among all the samples. Activation energy varied between 0.14 and 0.20 eV with the increase of substrate temperature from 300 to 500 °C. © 2018, Springer-Verlag GmbH Germany, part of Springer Nature.

Indexed keywords

Engineering controlled terms: Activation energy, Crystalline materials, Energy dispersive X ray analysis, Energy gap, Film preparation, Oxide films, Refractive index, Scanning electron microscopy, Spray pyrolysis, Substrates, Tin oxides, X ray powder diffraction

Engineering uncontrolled terms: Average crystalline size, Crystalline structure, Different substrates, Hall effect measurement, High-frequency dielectrics, Nebulized spray pyrolysis, Preferential orientation, Substrate temperature

Engineering main heading: Thin films

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Publisher: Springer Verlag

Amalraj, L.; Research Department of Physics, V.H.N.S.N. College, Virudhunagar, Tamilnadu, India;

Document details - Design of novel 3D flower-like neodymium molybdate: An efficient and challenging catalyst for sensing and destroying pulmonary toxicity antibiotic drug nitrofurantoin

Chemical Engineering Journal

Volume 346, 15 August 2018, Pages 11-23

Design of novel 3D flower-like neodymium molybdate: An efficient and challenging catalyst for sensing and destroying pulmonary toxicity antibiotic drug nitrofurantoin(Article)

Vinoth Kumar, J., Karthik, R., Chen, S.-M., Chen, K.-H., Sakthinathan, S., Muthuraj, V., Chiu, T.-W.

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Abstract

The extensive use of antibiotic drug (Nitrofurantoin; NFT) in pharmaceuticals and food producing animals may cause severe threats to both human health and animals. Besides, the residues of NFT can found or discharged into soil, rivers, lakes and local ground water can also cause serious health risks to living things. Therefore, rapid and highly selective detection as well as the removal of NFT from the foodstuff and water samples is very important concern. In the present study, we designed a novel 3D flower-like neodymium molybdate ($Nd_2Mo_3O_9$; NdM) catalyst by simple sol–gel route and evaluated for its bifunctional catalytic activity for the electrochemical detection and photodegradation of NFT for the first time. Moreover, the physicochemical properties of NdM were scrutinized by various analytical and spectroscopic techniques. The NdM modified screen printed carbon electrode (SPCE) showed an excellent electrocatalytic activity towards NFT with wide linear ranges (0.1–21 μM; 28–481 μM), lower detection limit (16 nM) and excellent selectivity in the existence of potentially co-interfering compounds (nitro group containing drugs; other nitro aromatic and biological compounds). Besides, the NdM modified SPCE was successfully applied to the real sample analysis in NFT oral suspension, water and urine samples, and the obtained recovery are well-satisfactory. Interestingly, the UV–visible spectroscopy results envisage that NdM could act as a superior photocatalyst which degrades above 99% of NFT solution under visible light irradiation. The trapping experiments revealed that hydroxyl radicals ([rad]OH) played the major role in the photodegradation process. These results suggested that the NdM is a more auspicious material for the degradation and determination of NFT, which creates it a novel and suitable candidate for the applications in electrocatalysis and photocatalysis. © 2018 Elsevier B.V.

Author keywords

Antibiotic drug | Electrocatalysis | Neodymium molybdate | Nitrofurantoin | Photocatalysis

Indexed keywords

Engineering controlled terms: Animals | Antibiotics | Chemical detection | Electrocatalysis | Electrodes | Groundwater | Health risks | Neodymium | Photocatalysis | Photodegradation | Sols

Engineering uncontrolled terms: Antibiotic drugs | Electrocatalytic activity | ELectrochemical detection | Nitrofurantoin | Physicochemical property | Screen-printed carbon electrodes | Spectroscopic technique | Visible-light irradiation

Engineering main heading: Catalyst activity

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Chen, S.-M.; Electroanalysis and Bioelectrochemistry Lab, Department of Chemical Engineering and Biotechnology, National Taipei University of Technology, No. 1, Section 3, Chung-Hsiao East Road, Taipei, Taiwan;

Document details - Effect of Zn doping on structural, morphological, optical and electrical properties of nebulized spray-deposited CdO thin films

Applied Physics A: Materials Science and Processing

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Effect of Zn doping on structural, morphological, optical and electrical properties of nebulized spray-deposited CdO thin films(Article)

Anitha, M., Anitha, N., Saravanakumar, K., Kulandaisamy, I., Amalraj, L.

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Abstract

Transparent and conducting pure and Zn-doped CdO thin films (0, 1, 2, 3 and 4 at.% Zn) have been successfully deposited on glass substrates at optimized substrate temperature of 200 °C by spray pyrolysis technique using nebulizer. Structural, morphological, optical and electrical properties of pure and Zn-doped CdO thin films are studied in detail. X-ray diffraction study confirms that all the CdO thin films were polycrystalline in nature with major reflection alone (111) plane having a cubic structure. The high average grain size (345 nm—SEM) and low RMS (6.46 nm—AFM) values are obtained for 3 at.% Zn-doped CdO thin films. The optical band gap energy had increased from 2.49 to 2.57 eV as the function of doping concentration had increased from 1 to 3 at.% Zn and thereafter decreased for higher doping concentration. A strong green emission and slightly shifted for Zn-doping concentration of CdO thin films exhibited by photoluminescence spectra. The CdO bond vibration confirmed by FTIR and Raman analyzes. The resistivity value of un-doped CdO thin film is 1.06×10^{-3} Ω cm and adding Zn-doped concentration, the resistivity consequently decreased to 6.2×10^{-4} Ω cm for 3 at.% Zn-doped CdO thin films and then furthermore increased. A high-quality factor (7.07×10^{-2}) was obtained for 3 at.% Zn-doped CdO thin films.

Indexed keywords

Engineering controlled terms: Conductive films; Energy gap; Fourier transform infrared spectroscopy; Optical films; Photoluminescence; Semiconductor doping; Spray pyrolysis; Substrates; Thin films; Vibration analysis; Zinc; Zinc compounds

Engineering uncontrolled terms: Doping concentration; High quality factors; Optical and electrical properties; Optical band gap energy; Photoluminescence spectrum; Spray-pyrolysis techniques; Substrate temperature; X-ray diffraction studies

Engineering main heading: Cadmium compounds

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Amalraj, L.; Research Department of Physics, V.H.N.S.N College (Autonomous), Virudhunagar, Tamil Nadu, India;

Document details - Fabrication of antimony doped tin disulfide thin films by an inexpensive, modified spray pyrolysis technique using nebulizer

Journal of Physics and Chemistry of Solids

Volume 119, August 2018, Pages 9-18

Fabrication of antimony doped tin disulfide thin films by an inexpensive, modified spray pyrolysis technique using nebulizer(Article)

Anitha, N., Anitha, M., Saravanakumar, K., Valanarasu, S., Amalraj, L.

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Abstract

The SnS_2 and antimony (Sb) doped SnS_2 thin films were effectively synthesized on glass substrates for different antimony doping concentrations (2, 4, 6, 8 at. %) using nebulized spray pyrolysis technique. The XRD analysis showed that all the films are polycrystalline having hexagonal structure with (001) preferential orientation. It was seen from the SEM photographs that the doping causes remarkable changes in the surface morphology. EDAX analysis clearly confirms presence of expected elements tin, sulfur and antimony in the final product, in appropriate proportions. Optical study exhibits that the band gap value of SnS_2 film decreases gradually with the increase in Sb doping concentration, reaching minimum band gap value of 2.55 eV at 6 at.% and starts increasing thereafter. Photoluminescence spectra depicted that the intensity of the emission peaks significantly varied with doping concentrations. The electrical study shows that the minimum resistivity value of 11 Ω cm with notable higher values of carrier concentration and mobility is achieved for 6 at.% of SnS_2: Sb film. The Raman spectra exposed that SnS_2 films had a broad peak at 314 cm^{-1}. © 2018 Elsevier Ltd

Author keywords

Electrical and optical studies | Nebulized spray pyrolysis | Optoelectronic devices | Sb doping | SnS_2 thin films

Indexed keywords

Engineering controlled terms: Antimony compounds | Carrier concentration | Energy gap | IV-VI semiconductors | Optoelectronic devices | Photoluminescence | Pyrolysis | Semiconducting tin compounds | Semiconductor doping | Spray pyrolysis | Substrates | Sulfur compounds | Thin films | Tin

Engineering uncontrolled terms: Doping concentration | Hexagonal structures | Nebulized spray pyrolysis | Optical study | Photoluminescence spectrum | Preferential orientation | Sb doping | Spray-pyrolysis techniques

Engineering main heading: Tin compounds

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Amalraj, L.; Research Department of Physics, V.H.N.S.N College (Autonomous), Virudhunagar, Tamil nadu, India;

Document details - Electrochemical Immunobiosensors for Point-of-Care Detection of Hypoxia Biomarkers

Management of High Altitude Pathophysiology

19 July 2018, Pages 257-276

Electrochemical Immunobiosensors for Point-of-Care Detection of Hypoxia Biomarkers
(Book Chapter)

Karunakaran, C., Santharaman, P., Balamurugan, M., Singh, S.K., Claussen, J.C.

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Abstract

Hypoxia, a state of reduced oxygen pressure below a critical threshold, restricts the function of organs, tissues, and cells. It induces myriad changes in the metabolites, proteins, and enzymes involved in important biological functions resulting in clinical obstacle. With the recent understanding of the molecular pathways regulated by hypoxia and the discovery of novel hypoxia markers, however, the prospect of targeting hypoxia has become more tangible. The measurements of these biologically important hypoxia biomarkers are imperative in human physiology because they provide valuable information regarding people at high altitude. We have fabricated miniaturized electrochemical immunobiosensors to measure various clinically important hypoxia biomarkers, including nitrite and its metabolites, cytochrome c, and superoxide dismutase using specific biorecognization elements, including enzymes and antibodies biofunctionalized nanocomposite modified screen printed electrodes (SPE). Combined with these immunobiosensors, cost-effective LabVIEW-based virtual instrumentation and a microcontroller-based portable electrochemical analyzer to determine hypoxia biomarkers for point-of-care applications have been successfully developed.

Author keywords

Cytochrome c | Electrochemical analyzer | Hypoxia | Immunobiosensors | LabVIEW | Microcontroller | Superoxide dismutase-1

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Karunakaran, C.; Department of Chemistry, Biomedical Research Lab, VHNSN College (Autonomous), Virudhunagar, India

Chapters in this book

View Scopus record for this book
16 chapters found in Scopus

- High Altitude and Hypoxia
- High Altitude Ailments: Causes and Effects
- Preface
- Hippophae sp.: A Boon for High-Altitude Maladies
- Valeriana sp.: The Role in Ameliorating High-Altitude Ailments
- Rhodiola sp.: The Herbal Remedy for High-Altitude Problems
- Cordyceps sp.: The Precious Mushroom for High-Altitude Maladies
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- Allopathic Remedies
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Topic:

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Document details - Influence of substrate temperature on the physical properties of SnS₂ thin films prepared using nebulized spray pyrolysis technique

Journal of Materials Science: Materials in Electronics

Volume 29, Issue 13, 1 July 2018, Pages 11529-11539

Influence of substrate temperature on the physical properties of SnS_2 thin films prepared using nebulized spray pyrolysis technique(Article)

Anitha, N., Anitha, M., Raj Mohamed, J., Valanarasu, S., Amalraj, L.

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Abstract

Influence of substrate temperature on the physical properties of Tin disulfide (SnS_2) thin films is investigated. X-ray diffraction studies revealed that the SnS_2 thin films are preferentially oriented as (001) plane. SEM analysis showed that SnS_2 thin films had platelet-like grains. EDAX analysis clearly confirms the presence of expected elements of tin and sulfur in appropriate proportions. Multiple interference effects were predominant in all these thin films in wavelength region of 500–1100 nm. The direct optical band gap of tin disulfide thin films had decreased from 3.26 to 2.7 eV with the increase in substrate temperature. Photoluminescence studies expose that the intensity of NBE emission peaks differs according to the substrate temperature. A minimum resistivity value of 2.19×10^1 Ω cm was obtained for the film grown at T_s = 250 °C. Hall Effect measurement exhibited that all the SnS_2 samples had n-type conductivity. Raman spectra exposed that SnS_2 films had a broad peak at 314 cm^{-1}.

Indexed keywords

Engineering controlled terms: Energy gap | IV-VI semiconductors | Physical properties | Semiconducting tin compounds | Spray pyrolysis | Sulfur compounds | Thin films

Engineering uncontrolled terms: Hall effect measurement | Multiple interferences | N-type conductivity | Nebulized spray pyrolysis | Resistivity values | Substrate temperature | Wavelength regions | X-ray diffraction studies

Engineering main heading: Tin compounds

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SciVal Topic Prominence

Topic:

Cited by 4 documents

Gadore, V. , Mishra, S.R. , Ahmaruzzaman, M.

Bio-inspired sustainable synthesis of novel SnS2/biochar nanocomposite for adsorption coupled photodegradation of amoxicillin and congo red: Effects of reaction parameters, and water matrices

(2023) Journal of Environmental Management

Gadore, V. , Mishra, S.R. , Ahmaruzzaman, M.

Green and environmentally sustainable fabrication of SnS2 quantum dots/chitosan nanocomposite for enhanced photocatalytic performance: Effect of process variables, and water matrices

(2023) Journal of Hazardous Materials

Gadore, V. , Mishra, S.R. , Ahmaruzzaman, M.

Facile green synthesis of SnS2 nanoparticles using Tulsi extract: insight into the optical and photocatalytic properties

(2023) International Journal of Environmental Analytical Chemistry

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Document details - Influence of a novel co-doping (Zn + F) on the physical properties of nano structured (111) oriented CdO thin films applicable for window layer of solar cell

Applied Surface Science

Volume 443, 15 June 2018, Pages 55-67

Influence of a novel co-doping (Zn + F) on the physical properties of nano structured (111) oriented CdO thin films applicable for window layer of solar cell(Article)

Anitha, M., Saravanakumar, K., Anitha, N., Amalraj, L.

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Abstract

Un-doped and co-doped (Zn + F) cadmium oxide (CdO) thin films were prepared by modified spray pyrolysis technique using a nebulizer on glass substrates kept at 200 °C. They were characterized by X-ray diffraction (XRD), X-ray photoelectron spectra (XPS), scanning electron microscopy (SEM), UV-vis spectroscopy, Hall Effect and photoluminescence (PL) respectively. The thin films were having thickness in the range of 520–560 nm. They were well crystalline and displayed high transparency of about >70% in the visible region. It was clearly seen from the SEM photographs that co-doping causes notable changes in the surface morphology. Electrical study exhibited the resistivity of co-doped CdO thin films drastically fell to 1.43×10^{-4} Ω-cm compared with the un-doped CdO thin film. The obtained PL spectra were well corroborated with the structural and optical studies. The high transparency, wide band gap energy and enhanced electrical properties obtained infer that Zn + F co-doped CdO thin films find application in optoelectronic devices, especially in window layer of solar cells. © 2018 Elsevier B.V.

Author keywords

CdO | Nebulized spray pyrolysis | Optical properties | Structural properties | Thin films

Indexed keywords

Engineering controlled terms: Cadmium compounds | Energy gap | Optical properties | Optoelectronic devices | Oxide films | Scanning electron microscopy | Semiconductor doping | Solar cells | Spray pyrolysis | Structural properties | Substrates | Transparency | Ultraviolet visible spectroscopy | X ray diffraction | X ray photoelectron spectroscopy

Engineering uncontrolled terms: Electrical studies | Glass substrates | High transparency | Nano-structured | Nebulized spray pyrolysis | Spray-pyrolysis techniques | UV-vis spectroscopy | X ray photoelectron spectra

Engineering main heading: Thin films

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Amalraj, L.; Research Department of Physics, V.H.N.S.N College (Autonomous), Virudhunagar, Tamil Nadu, India;

Document details - Recent advances and emerging opportunities in phytochemical synthesis of ZnO nanostructures

Materials Science in Semiconductor Processing

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Recent advances and emerging opportunities in phytochemical synthesis of ZnO nanostructures(Review)

Vishnukumar, P., Vivekanandhan, S., Misra, M., Mohanty, A.K.

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[c]School of Engineering, Thornbrough Building, University of Guelph, Guelph, ON N1G 2W1, Canada

Abstract

Zinc oxide (ZnO) nanostructures possess an extensive scientific and technological significance, not only for their unique physicochemical properties but also due to their potential applications in many commercial products. This includes optoelectronics devices, solar cells, photocatalysis, sensors, antimicrobial products and biomedical technologies. A wide range of physical and chemical processes have been effectively explored for the synthesis of ZnO nanomaterials with different structural and morphological features. As the demand for ZnO nanoparticles expands, it is necessary to explore simple and eco-friendly methods, which are alternatives to the traditional practices. Recently, the biological synthesis of ZnO nanoparticles by employing various bio-resources including plants, plant derivatives, microbes and marine products receives significant attention. Effective knowledge dissemination will enable the viability of biogenic processes for the synthesis of various metal oxide nanoparticles including ZnO. Thus, the present review summarizes the recent advancements in the biological synthesis of ZnO and ZnO derived functional nanoparticles through phytochemical processes employing various plants and their derivatives. © 2018 Elsevier Ltd

Author keywords

Nanofabrication | Nanoparticles | Phytochemistry | Sustainable Synthesis | Zinc Oxide

Indexed keywords

Engineering controlled terms: Biosynthesis | II-VI semiconductors | Metal nanoparticles | Metals | Microorganisms | Nanoparticles | Nanostructures | Nanotechnology | Synthesis (chemical) | Zinc | Zinc oxide

Engineering uncontrolled terms: Biomedical technologies | Functional nanoparticles | Metal oxide nanoparticles | Optoelectronics devices | Physicochemical property | Phytochemistry | Technological significance | Zinc oxide (ZnO) nanostructures

Engineering main heading: ZnO nanoparticles

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Vivekanandhan, S.; Sustainable Materials and Nanotechnology Lab, Department of Physics, VHNSN College, Virudhunagar, Tamilnadu, India;

Document details - Effect of substrates on the structural, morphological, and optical properties of sprayed CdO thin films using nebulizer

Journal of Sol-Gel Science and Technology

Volume 86, Issue 3, 1 June 2018, Pages 580-589

Effect of substrates on the structural, morphological, and optical properties of sprayed CdO thin films using nebulizer(Article)

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Abstract

CdO thin films were deposited on glass, quartz, FTO, silicon wafers of p-type and n-type at 200 °C of substrate temperature employing spray pyrolysis technique using nebulizer. As deposited cadmium oxide thin films were analyzed to find crystallite size, morphology of the substrate, elemental composition and band gap using X-ray diffraction (XRD), scanning electron microscopy (SEM), energy dispersive X-ray spectroscopy (EDAX) and UV–Vis spectrophotometer. Nature of the thin film was found to be polycrystalline with face centered cubic structure with (111) preferential orientation and evaluated structural parameters show significant effect of used substrates. Spherical sized grains were observed on the surface of the thin films using SEM. The EDAX analysis confirmed that cadmium and oxygen were present in the sample. Direct allowed transition with band gap values lying in the range 2.34–2.44 eV for all the films deposited on various substrates. Among, these thin film coated on FTO substrate was found to have high crystallinity with a narrow band gap, which may be more suitable for opto-electronic applications. [Figure not available: see fulltext.].

Author keywords

Cadmium oxide | Optical properties | Substrates | TCO | Thin film | XRD

Indexed keywords

Engineering controlled terms: Cadmium compounds | Crystallite size | Energy dispersive spectroscopy | Energy gap | Optical properties | Oxide films | Scanning electron microscopy | Silicon wafers | Spray pyrolysis | Thin films | X ray diffraction

Engineering uncontrolled terms: Cadmium oxide | Elemental compositions | Energy dispersive X ray spectroscopy | Face centered cubic structure | Optoelectronic applications | Preferential orientation | Spray-pyrolysis techniques | Substrate temperature

Engineering main heading: Substrates

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Document details - One-step sonochemical synthesis of 1D β-stannous tungstate nanorods: An efficient and excellent electrocatalyst for the selective electrochemical detection of antipsychotic drug chlorpromazine

Ultrasonics Sonochemistry

Volume 44, June 2018, Pages 231-239

One-step sonochemical synthesis of 1D β-stannous tungstate nanorods: An efficient and excellent electrocatalyst for the selective electrochemical detection of antipsychotic drug chlorpromazine(Article)

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Abstract

In the modern world, the contamination of ecosystem by human and veterinary pharmaceutical drugs through the metabolic excretion, improper disposal/industrial waste has been subjected to a hot issue. Therefore, exploitation of exclusive structured material and reliable technique is a necessary task to the precise detection of drugs. With this regards, we made an effort for the fabrication of novel one-dimensional (1D) stannous tungstate nanorods (β-SnW NRs) via simple sonochemical approach and used as an electrochemical sensor for the detection of antipsychotic drug chlorpromazine (CPZ) for the first time. The crystallographic structure, surface topology, elemental compositions and their distributions and ionic states were enquired by different spectroscopic techniques such as XRD, FTIR, SEM, EDS, elemental mapping and XPS analysis. The developed β-SnW NRs/GCE sensor exhibits a rapid and sensitive electrochemical response towards CPZ sensing with wide linear response range (0.01–457 μM), high sensitivity (2.487 μA μM^{-1} cm^{-2}), low detection limit (0.003 μM) and excellent selectivity. Besides, the as-proposed electrochemical sensor was successfully applied to real sample analysis in commercial CPZ drug and biological fluids and the acquired recovery results are quite satisfactory. The proposed sonochemical method for the preparation of β-SnW NRs is low cost, very simple, fast and efficient for sensor applications. © 2018 Elsevier B.V.

Author keywords

Biological samples | Chlorpromazine | Electrochemical sensor | Pharmaceutical drug | Sonochemical approach | Stannous tungstate

Indexed keywords

Engineering controlled terms: Chemical detection | Electrocatalysts | Nanorods | Sonochemistry | Spectroscopic analysis | Tungsten compounds | Waste disposal

Engineering uncontrolled terms: Biological samples | Chlorpromazine | Pharmaceutical drugs | Sonochemical | Stannous tungstate

Engineering main heading: Electrochemical sensors

Prominence percentile:

EMTREE drug terms: ascorbic acid, catechol, chlorine, chlorpheniramine maleate, chlorpromazine, copper, cysteine, dopamine, glucose, histidine, lactose, leucine, methionine, metronidazole, multi walled nanotube, nanorod, neuroleptic agent, pyridoxine, riboflavin, serotonin, sodium, stannous tungstate, tin oxide, tryptophan, tungsten derivative, unclassified drug, urea, valine, chlorpromazine, nanotube, neuroleptic agent, tin, tungsten

EMTREE medical terms: Article, cyclic potentiometry, drug blood level, drug determination, drug urine level, electrochemical detection, Fourier transformation, human, infrared spectroscopy, measurement accuracy, normal human, pH, priority journal, reproducibility, sonochemical synthesis, synthesis, tablet, transmission electron microscopy, ultrasound, X ray photoelectron spectroscopy, X ray powder diffraction, chemistry, electrochemical analysis, limit of detection, powder diffraction, procedures, spectroscopy, X ray photoemission spectroscopy

MeSH: Antipsychotic Agents, Chlorpromazine, Electrochemical Techniques, Limit of Detection, Nanotubes, Photoelectron Spectroscopy, Powder Diffraction, Sonication, Spectrometry, X-Ray Emission, Spectroscopy, Fourier Transform Infrared, Tin, Tungsten

Chemicals and CAS Registry Numbers:

ascorbic acid, 134-03-2, 15421-15-5, 50-81-7; catechol, 120-80-9; chlorine, 13981-72-1, 7782-50-5; chlorpheniramine maleate, 113-92-8; chlorpromazine, 50-53-3, 69-09-0; copper, 15158-11-9, 7440-50-8; cysteine, 4371-52-2, 52-89-1, 52-90-4; dopamine, 51-61-6, 62-31-7; glucose, 50-99-7, 84778-64-3; histidine, 645-35-2, 7006-35-1, 71-00-1; lactose, 10039-26-6, 16984-38-6, 63-42-3, 64044-51-5; leucine, 61-90-5, 7005-03-0; methionine, 59-51-8, 63-68-3, 7005-18-7; metronidazole, 39322-38-8, 443-48-1; pyridoxine, 12001-77-3, 58-56-0, 65-23-6, 8059-24-3; riboflavin, 83-88-5; serotonin, 50-67-9; sodium, 7440-23-5; tin oxide, 1332-29-2, 21651-19-4; tryptophan, 6912-86-3, 73-22-3; urea, 57-13-6; valine, 7004-03-7, 72-18-4; tin, 14314-35-3, 7440-31-5; tungsten, 7440-33-7;

Antipsychotic Agents; Chlorpromazine; Tin; Tungsten

Drug tradename:

winsumin

Device tradename:

UP200S

Manufacturers:

Drug manufacturer:

Sigma Aldrich, United States

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Chen, S.-M.; Electroanalysis and Bioelectrochemistry Lab, Department of Chemical Engineering and Biotechnology, National Taipei University of Technology, No.1, Section 3, Chung-Hsiao East Road, Taipei, Taiwan;

Document details - Photo-degradation of CT-DNA with a series of carbothioamide ruthenium (II) complexes – Synthesis and structural analysis

Journal of Molecular Structure

Volume 1157, 5 April 2018, Pages 201-209

Photo-degradation of CT-DNA with a series of carbothioamide ruthenium (II) complexes – Synthesis and structural analysis(Article)

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[b]P.G and Research Department of Chemistry, Nehru Memorial College, Puthanampatti, Tiruchirappalli, Tamil Nadu, India

Abstract

The present research article is related with the method of preparation, structure and spectroscopic properties of a series of carbothioamide ruthenium (II) complexes with N and S donor ligands namely, 2-((6-chloro-4-oxo-4H-chromen-3-yl)methylene) hydrazine carbothioamide (ClChrTs)/2-((6-methoxy-4-oxo-4H-chromen-3-yl)methylene)hydrazine carbothioamide (MeOChrTS). The synthesized complexes were characterized by several techniques using analytical methods as well as by spectral techniques such as FT-IR, ^{1}HNMR, ^{13}CNMR, ESI mass and thermogravimetry/differential thermal analysis (TG-DTA). The IR spectra shows that the ligand acts as a neutral bidentate with N and S donor atoms. The biological activity of the prepared compounds and metal complexes were tested against cell line of calf-thymus DNA via an intercalation mechanism (MCF-7). In addition, the interaction of Ru(II) complexes and its free ligands with CT-DNA were also investigated by titration with UV–Vis spectra, fluorescence spectra, and Circular dichroism studies. Results suggest that both of the two Ru(II) complexes can bind with calf-thymus DNA via an intercalation mechanism. © 2017 Elsevier B.V.

Author keywords

Calf thymus-DNA | Cell line | Chromonal | Fluorescence | UV–Visible

Indexed keywords

Engineering controlled terms: Bioactivity | Cell culture | Dichroism | DNA | Fluorescence | Hydrazine | Ligands | Metal complexes | Nitrogen compounds | Ruthenium | Ruthenium compounds | Thermoanalysis | Thermogravimetric analysis | Thymus

Engineering uncontrolled terms: Calf thymus DNA | Cell lines | Chromonal | Fluorescence spectra | Intercalation mechanisms | Ruthenium complexes | Spectral techniques | Spectroscopic property

Engineering main heading: Synthesis (chemical)

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Umadevi, M.; P.G and Research Department of Chemistry, Nehru Memorial College, Puthanampatti, Tiruchirappalli, Tamil Nadu, India;

Document details - Influence of tin precursor concentration on physical properties of nebulized spray deposited tin disulfide thin films

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Influence of tin precursor concentration on physical properties of nebulized spray deposited tin disulfide thin films(Article)(Open Access)

Anitha, N., Anitha, M., Raj Mohamed, J., Valanarasu, S., Amalraj, L.

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Abstract

Tin disulfide thin films were prepared with different molarities of tin species (M_{Sn}) at the optimized substrate temperature using the Nebulized Spray pyrolysis technique to obtain better crystallinity with mono phase thin films. The concentration of Tin IV chloride Penta hydrate precursor is varied from 0.05:0.4 to 0.25:0.4 ($SnCl_4.5H_2O$: thiourea) to achieve correct stoichiometry and to tune the concentration of Tin ions in the SnS_2 thin films. These films were well adherent, uniform, and shiny. Lower concentrations of Tin yields highly textured SnS_2 thin films with (001) crystallite orientation. On increasing the concentration, the multi-phases (SnS and Sn_2S_3) were found to be present along with SnS_2 material. The platelet-like grains were observed from SEM analysis in these SnS_2 films. Multiple interference effects were predominant in all these thin films in the wavelength region of 600–1100 nm. The direct optical band gap of tin disulfide thin films had decreased from 3.2 eV to 2.75 eV with an increase in M_{Sn} from 0.05 to 0.2 M, respectively, and further increased to 3.0 eV for 0.25 M concentration. Using Hall Effect measurement, the type of semiconductor is found to be of n-type. A minimum resistivity value of 2.19×10^3 Ω cm was obtained for the film grown at M_{Sn} = 0.2 M.

Author keywords

nebulized spray pyrolysis | Precursor concentration | thin films | tin disulfhide

Indexed keywords

Engineering controlled terms: Chlorine compounds | Energy gap | IV-VI semiconductors | Layered semiconductors | Semiconducting tin compounds | Spray pyrolysis | Sulfur compounds | Thin films

Engineering uncontrolled terms: Crystallite orientation | Hall effect measurement | Multiple interferences | Nebulized spray pyrolysis | Precursor concentration | Resistivity values | Substrate temperature | Wavelength regions

Engineering main heading: Tin compounds

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Amalraj, L.; Research Department of Physics, V. H. N. S. N. College (Autonomous), Virudhunagar, India;

Document details - Studies on optical and electrical properties of green synthesized TiO₂@Ag core-shell nanocomposite material

Materials Research Express

Volume 5, Issue 4, April 2018, Article number 045020

Studies on optical and electrical properties of green synthesized TiO_2@Ag core-shell nanocomposite material(Article)

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Abstract

Newly adopted green approach has been used to synthesize pure titanium dioxide (TiO_2) nanoparticles (NPs) and silver deposited titanium dioxide (TiO_2@Ag) core-shell nanocomposite (CSNC) from Nigella Sativa (black cumin) seed extract for the first time. The phytochemicals available in Nigella Sativa (NS) seed extract acts as reducing agent in the formation of nanoparticles as well as nanocomposite. The morphology, crystal structure, particle size and phase composition of green synthesized TiO_2 NPs and TiO_2@Ag CSNC are investigated by High Resolution Transmission Electron Microscopy (HRTEM), Field Emission Scanning Electron Microscopy (FESEM), Powder x-ray diffraction (PXRD), FT-Raman and Fourier Transform Infrared spectroscopy (FT-IR). The red shift in (from 333 nm to 342 nm) UV-Vis spectrum confirmed the deposition of Ag on TiO_2. The reduced intensity peaks of Photoluminescence spectra (PL) also indicate the deposition of Ag on TiO_2. Further the electrical properties of pure TiO_2 and TiO_2@Ag CSNC have studied by dielectric studies and ac conductivity measurements. The dielectric constant and the dielectric loss of TiO_2@Ag CSNC are better than pure TiO_2. From these improved results, the green synthesized TiO_2@Ag CSNC from NS seed extract is may be a suitable material for device fabrication in the visible region. © 2018 IOP Publishing Ltd.

Author keywords

electrical properties | nanocomposites | nanoparticles | UV-vis diffuse reflectance spectrum

Indexed keywords

Engineering controlled terms: Crystal structure | Deposition | Dielectric losses | Electric properties | Field emission microscopes | Fourier transform infrared spectroscopy | High resolution transmission electron microscopy | High-k dielectric | Nanocomposites | Nanoparticles | Oxides | Particle size | Phase composition | Photoluminescence | Red Shift | Scanning electron microscopy | Shells (structures) | Synthesis (chemical) | TiO2 nanoparticles | Titanium dioxide

Engineering uncontrolled terms: Core-shell nanocomposites | Device fabrications | Field emission scanning electron microscopy | Fourier transform infra red (FTIR) spectroscopy | Optical and electrical properties | Photoluminescence spectrum | Powder X-ray diffraction (pXRD) | UV-vis diffuse reflectance spectra

Engineering main heading: Silver compounds

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Document details - A novel sulphur decorated 1-D MoO₃ nanorods: Facile synthesis and high performance for photocatalytic reduction of hexavalent chromium

Journal of Photochemistry and Photobiology A: Chemistry

Volume 356, 1 April 2018, Pages 642-651

A novel sulphur decorated 1-D MoO_3 nanorods: Facile synthesis and high performance for photocatalytic reduction of hexavalent chromium(Article)

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Abstract

In the present study, we report a simple approach for the fabrication of novel sulphur decorated MoO_3 nanorods (S@MoO_3 nanorods) by using simple solution process method for the very first time. The phase structural, morphology and optical properties of the as-prepared nanomaterials were comparatively characterized. The sulphur (S) nanosheets were well decorated on the surface of MoO_3 rods which was clearly observed from TEM images. The applicability of the as synthesized S@MoO_3 nanocomposite was demonstrated as superior photocatalyst for the photocatalytic reduction of toxic hexavalent chromium Cr(VI) to nontoxic trivalent chromium Cr(III) under visible light illumination. The photocatalytic reduction results suggested that the 1% of S@MoO_3 nanorods was exhibited excellent visible light photocatalytic activity efficiency compared to pure MoO_3, S and other S@MoO_3 nanocomposites. The enhancement in the photocatalytic performance of 1% S@MoO_3 nanorods was mainly attributed to the strong absorption in visible region and low recombination or high separation efficiency for photogenerated electrons and holes. The trapping experiments reveals that O_2[rad]$^-$ radical species was strongly supported for the photocatalytic reduction of Cr(VI). The present protocols reported open up an S decorated photocatalyst might be a potential candidate for Cr(VI) removal in environmental.

Author keywords

Cr(VI) Nanorods Photocatalytic reduction S@MoO_3 Visible light photocatalyst

Funding details

Funding sponsor	Funding number	Acronym
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Funding text

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Document details - Exploiting the biological efficacy of benzimidazole based Schiff base complexes with L-Histidine as a co-ligand: Combined molecular docking, DNA interaction, antimicrobial and cytotoxic studies

Bioorganic Chemistry

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Exploiting the biological efficacy of benzimidazole based Schiff base complexes with L-Histidine as a co-ligand: Combined molecular docking, DNA interaction, antimicrobial and cytotoxic studies(Article)

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Abstract

Four new metal complexes were synthesized and screened for their cytotoxic activity after sufficient assertion from the preliminary DNA binding studies. The metal complexes could bind to CT-DNA through intercalation binding mode. This has also been confirmed by the molecular docking studies. The DNA cleavage efficiencies of these complexes with pBR322 DNA were investigated by gel electrophoresis. The complexes were found to promote the cleavage of pBR322 DNA from the supercoiled form I to the open circular form II in the presence of an oxidizing agent (H_2O_2). The in vitro chemosensitivity of the studied complexes exhibits significant cytotoxic effects, compared to those reported for cisplatin. These findings represent a prompting to search for the probable interaction of these complexes with other cellular elements of fundamental consequence in cell proliferation. The in vitro anticancer activities indicate that the Cu(II) complex is active against the selected human tumor cell lines, and the order of in vitro anticancer activities is consistent with the DNA-binding affinities. Towards noncancerous cell line, Cu(II) complex exhibits very low toxicity. On the other hand all the complexes have been found to exhibit cytotoxic effects against cancerous cell lines with potency more than that of the widely used drug cisplatin and hence they have the potential to act as promising anticancer agents. Captivatingly, they are non-toxic to normal cell lymphocytes revealing that they are selective in killing only the cancer cells.

Author keywords

Cytotoxicity | DNA binding studies | Gel electrophoresis | Molecular docking | Schiff base metal complexes

Indexed keywords

EMTREE drug terms: benzimidazole | cisplatin | cupric ion | fluconazole | histidine | hydrogen peroxide | kanamycin A | Schiff base | antineoplastic agent | benzimidazole | benzimidazole derivative | DNA | histidine | ligand | Schiff base

EMTREE medical terms: antibacterial activity | antifungal activity | antimicrobial activity | antineoplastic activity | Article | cancer cell line | chemosensitivity | circular dichroism | drug cytotoxicity | drug DNA interaction | drug efficacy | human | human cell | in vitro study | minimum inhibitory concentration | molecular docking | nonhuman | priority journal | cell proliferation | chemical structure | chemistry | DNA probe | dose response | drug effect | drug screening | electrochemical analysis | Gram negative bacterium | Gram positive bacterium | microbial sensitivity test | pharmacology | structure activity relation | synthesis | tumor cell line

MeSH: Antineoplastic Agents | Benzimidazoles | Cell Line, Tumor | Cell Proliferation | DNA | DNA Probes | Dose-Response Relationship, Drug | Drug Screening Assays, Antitumor | Electrochemical Techniques | Gram-Negative Bacteria | Gram-Positive Bacteria | Histidine | Humans | Ligands | Microbial Sensitivity Tests | Molecular Docking Simulation | Molecular Structure | Schiff Bases | Structure-Activity Relationship

Chemicals and CAS Registry Numbers:

benzimidazole, 51-17-2; cisplatin, 15663-27-1, 26035-31-4, 96081-74-2; fluconazole, 86386-73-4; histidine, 645-35-2, 7006-35-1, 71-00-1; hydrogen peroxide, 7722-84-1; kanamycin A, 25389-94-0, 59-01-8; DNA, 9007-49-2;

Antineoplastic Agents; benzimidazole; Benzimidazoles; DNA; DNA Probes; Histidine; Ligands; Schiff Bases

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Publisher: Academic Press Inc.

Raman, N.; Research Department of Chemistry, VHNSN College, Virudhunagar, India;

Document details - Biological contour, molecular docking and antiproliferative studies of DNA targeted histidine based transition metal(II) complexes: Invention and its depiction

Applied Organometallic Chemistry

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Biological contour, molecular docking and antiproliferative studies of DNA targeted histidine based transition metal(II) complexes: Invention and its depiction(Article)

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Abstract

A novel series of histidine derived transition metal complexes were synthesized and characterized by multispectral techniques such as UV-Vis., FT IR, EPR, NMR, ESI-mass analysis and other physico-chemical methods like elemental analysis, molar conductivity, magnetic susceptibility. The synthesized compounds were attempted for their biological prospective. The biological studies involved are DNA interaction (binding and damage), antimicrobial, antioxidant, antiproliferative and molecular docking. DNA interaction studies were carried out with the help of UV-Vis absorption titration, viscosity measurement and cyclic voltammetric techniques which revealed that the synthesized compounds could interact with CT-DNA through intercalative binding mode. A gel electrophoresis assay demonstrated the ability of complexes to cleave the supercoiled pUC18 DNA. The antioxidant property shows that the metal complexes have preferable ability to scavenge hydroxyl radical than the ligand. Moreover, the antimicrobial assay indicates that these complexes are good antimicrobial agents against various pathogens. Furthermore, the in vitro antiproliferative activities of the complexes were examined on HeLa, Hep G2 and NIH 3 T3 cell lines using an MTT assay. The morphological changes were investigated using Hoechst 33258 staining apoptosis assay. In addition, molecular docking studies were executed to considerate the nature of binding of the synthesized complexes with protein and DNA. Copyright © 2018 John Wiley & Sons, Ltd.

Author keywords

antioxidant activity | antiproliferative activity | DNA interaction | histidine | molecular docking

Indexed keywords

Engineering controlled terms: Amino acids | Antimicrobial agents | Antioxidants | Binding energy | Bins | Biosynthesis | Cell culture | Cell death | Chemical analysis | DNA | Electrophoresis | Lanthanum compounds | Magnetic susceptibility | Metal complexes | Microorganisms | Molecular modeling | Nuclear magnetic resonance | Plants (botany) | Transition metal compounds | Transition metals | Viscosity measurement

Engineering uncontrolled terms: Anti-oxidant activities | Anti-proliferative activities | DNA interaction | Histidine | Molecular docking

Engineering main heading: Synthesis (chemical)

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Prominence percentile:

Raman, N.; Research Department of Chemistry, VHNSN College, Virudhunagar, India;

Document details - Highly selective electrochemical detection of antipsychotic drug chlorpromazine in drug and human urine samples based on peas-like strontium molybdate as an electrocatalyst

Inorganic Chemistry Frontiers

Volume 5, Issue 3, March 2018, Pages 643-655

Highly selective electrochemical detection of antipsychotic drug chlorpromazine in drug and human urine samples based on peas-like strontium molybdate as an electrocatalyst(Article)

Kumar, J.V., Karthik, R., Chen, S.-M., Kokulnathan, T., Sakthinathan, S., Muthuraj, V., Chiu, T.-W., Chen, T.-W.

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Abstract

The countless use of antibiotics in veterinary and human medicine causes severe health risks to both humans and animals. In this context, monitoring of the antibiotic drug in the veterinary and human pathological system is important and provokes a universal challenge. Therefore, development of simple and sensitive inorganic materials with unique morphology is of great importance for the trace level monitoring of pharmaceutical content in the environment. Herein, we developed a novel peas-like strontium molybdate catalyst ($SrMoO_4$; SrM) synthesized by a simple sonochemical approach and utilized as an electrochemical sensor for the detection of antipsychotic drug chlorpromazine (CPZ). The crystalline structure, surface morphology, elemental compositions and textural properties were systematically investigated by various analytical and spectroscopic techniques. As an electrochemical sensor, inorganic binary SrM modified screen printed carbon electrode (SrM/SPCE) exhibited an enhanced electrocatalytic activity towards CPZ sensing with excellent analytical performance such as wide linear response ranges and lowest detection limit of 0.1-143 and 153-1683 μM and 0.028 μM respectively. Moreover, the as-prepared SrM/SPCE showed an excellent selectivity even in the existence of co-interfering drugs, biological compounds and common metal ions. In addition, the SrM/SPCE applied to the real samples analysis in commercially available CPZ drug and human urine samples and the observed recoveries are quite satisfactory.

Indexed keywords

Engineering controlled terms: Antibiotics, Body fluids, Chemical detection, Electrocatalysts, Electrodes, Health risks, Metal ions, Strontium

Engineering uncontrolled terms: Analytical performance, Crystalline structure, Electrocatalytic activity, ELectrochemical detection, Elemental compositions, Linear response range, Screen-printed carbon electrodes, Spectroscopic technique

Engineering main heading: Electrochemical sensors

Funding details

Funding sponsor	Funding number	Acronym
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Publisher: Royal Society of Chemistry

Chen, S.-M.; Electroanalysis and Bioelectrochemistry Lab, Department of Chemical Engineering and Biotechnology, National Taipei University of Technology, No. 1 Section 3 Chung-Hsiao East Road, Taipei, Taiwan;

Document details - Photocatalytic degradation of organic contaminants by g-C₃N₄/EPDM nanocomposite film: Viable, efficient and facile recoverable

Materials Science and Engineering C

Volume 84, 1 March 2018, Pages 188-194

Photocatalytic degradation of organic contaminants by g-C_3N_4/EPDM nanocomposite film: Viable, efficient and facile recoverable(Article)

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Abstract

The original metal free graphitic carbon nitride/ethylene propylene diene monomer nanocomposite film (g-C_3N_4/EPDM NCF) was fabricated by facile solution cast method. g-C_3N_4/EPDM NCF with diameter (50 mm) and thickness (4 mm) was investigated towards the photocatalytic degradation of methylene blue (MB) and methyl orange (MO) dye solution under visible light irradiation. The as synthesized g-C_3N_4/EPDM NCF was exhibited high crystalline nature with the crystalline size of 21.53 nm, the smooth surface nature and the particle size was observed from the TEM analysis is 20 nm. Furthermore, the influence of operational parameters was carried out which demonstrated that 100 mg photocatalyst and 25 μM of dye concentration were obtained as an optimized condition for the best photocatalytic degradation results. As a result of scavenger experiment, it was concluded that the hydroxyl radical ([rad]OH) was actively involved in the photocatalytic degradation. The g-C_3N_4/EPDM NCF were recoverable from the photocatalytic reaction system and the present find findings may open up a new platform for the simple handpicked photocatalyst. © 2017 Elsevier B.V.

Author keywords

100% recoverability | Dye contaminant | g-C_3N_4/EPDM | Handpicking method | Photocatalytic degradation | Polymer

Indexed keywords

Engineering controlled terms: Aromatic compounds | Azo dyes | Carbon | Crystalline materials | Dyes | Impurities | Nanocomposites | Particle size | Particle size analysis | Photodegradation | Polymers

Engineering uncontrolled terms: g-C3N4/EPDM | Graphitic carbon nitrides | Handpicking method | Operational parameters | Photo catalytic degradation | Photocatalytic reactions | Recoverability | Visible-light irradiation

Engineering main heading: Nanocomposite films

EMTREE drug terms: azo compound | cyanogen | elastomer | ethylene derivative | ethylene-propylene-diene-monomer | graphite | hydroxyl radical | methyl orange | methylene blue | nanocomposite | nitrile

EMTREE medical terms: catalysis | chemistry | infrared spectroscopy | light | particle size | photolysis | radiation response | transmission electron microscopy | water pollutant | X ray diffraction

MeSH: Azo Compounds | Catalysis | Elastomers | Ethylenes | Graphite | Hydroxyl Radical | Light | Methylene Blue | Microscopy, Electron, Transmission | Nanocomposites | Nitriles | Particle Size | Photolysis | Spectroscopy, Fourier Transform Infrared | Water Pollutants, Chemical | X-Ray Diffraction

Chemicals and CAS Registry Numbers:

graphite, 7782-42-5; hydroxyl radical, 3352-57-6; methyl orange, 547-58-0; methylene blue, 61-73-4;

Azo Compounds; cyanogen; Elastomers; ethylene-propylene-diene-monomer; Ethylenes; Graphite; Hydroxyl Radical; methyl orange; Methylene Blue; Nitriles; Water Pollutants, Chemical

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Selvam, V.; Department of Chemistry, VHNSN College, Virudhunagar, Tamil Nadu, India;

Document details - Effective Photodegradation of CR & MO dyes by morphologically controlled Cerium oxide nanocubes under visible light Illumination

Optik

Volume 154, February 2018, Pages 242-250

Effective Photodegradation of CR & MO dyes by morphologically controlled Cerium oxide nanocubes under visible light Illumination(Article)

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Abstract

Synthesis of novel CeO_2 nanocubes via simple wet chemical method has described in this manuscript. Since the CeO_2 nanoparticles have been admired for their properties and extensive applications in the recent years, the structural properties and morphology of the obtained materials were investigated in detail. The results indicated that formation of CeO_2 nanocubes and it act as very dynamic photocatalyst in visible region. When applied to the photocatalytic degradation of Congo red (CR) and methyl orange (MO) dyes, the best results were obtained when using this catalyst which is due to the formation of more reactive oxygen species owing to the presence of Ce^{4+}/Ce^{3+}. The photodegradation efficiency of CeO_2 nanocubes was 95% within 100 & 90 min for CR and MO respectively. Furthermore, the catalyst can be easily recovered and reused until fifth cycles without significant loss of activity. © 2017 Elsevier GmbH

Author keywords

CeO_2 nanocubes | Dye degradation | Photocatalyst | Semiconductor

Indexed keywords

Engineering controlled terms: Azo dyes | Catalysts | Photocatalysts | Photodegradation | Semiconductor materials

Engineering uncontrolled terms: CeO2 nanoparticles | Dye degradation | Nanocubes | Photo catalytic degradation | Photodegradation efficiency | Reactive oxygen species | Visible region | Wet-chemical method

Engineering main heading: Dyes

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Document details - Synthesis, characterization and biological screening studies of mixed ligand complexes using flavonoids as precursors

Applied Organometallic Chemistry

Volume 32, Issue 2, February 2018, Article number e4030

Synthesis, characterization and biological screening studies of mixed ligand complexes using flavonoids as precursors(Article)

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Abstract

Flavonoids are a group of plant phenolics that provide various health benefits through cell signalling pathways and antioxidant effects. In the present study, a new series of mixed ligand complexes of Co(II), Ni(II), Cu(II) and Zn(II) were synthesized by incorporating curcumin and quercetin flavonoid precursors. The structural features of the synthesized complexes were explored using elemental analysis, thermogravimetric analysis, UV–visible, infrared, NMR, mass and electron paramagnetic resonance spectral analyses and conductivity measurements. These data support an octahedral geometry of the synthesized complexes. In silico biological activity score for the ligand was predicted using PASS online software. ADMET properties were studied using VLS3D online software. Anti-inflammatory and antioxidant activities were experimentally validated which prove that theoretical predictions are in agreement with the experimental results. Interestingly the synthesized complexes interact with calf thymus DNA through groove binding mode. Moreover, they have good potential to cleave pUC19 DNA. Minimum inhibitory concentration values of the synthesized complexes reveal that they have better antimicrobial efficacy than the ligands. Copyright © 2017 John Wiley & Sons, Ltd.

Author keywords

anti-inflammatory | antioxidant | curcumin Schiff base | DNA cleavage | flavonoids | VLS3D

Indexed keywords

Engineering controlled terms: Antioxidants | Binding energy | Bioactivity | Cell signaling | Chelation | Cobalt compounds | Complexation | DNA | Flavonoids | Ligands | Magnetic resonance | Nuclear magnetic resonance | Paramagnetic resonance | Plants (botany) | Spectrum analysis | Thermogravimetric analysis | Zinc compounds

Engineering uncontrolled terms: Anti-inflammatories | Anti-oxidant activities | Conductivity measurements | DNA cleavage | Minimum inhibitory concentration | Mixed ligand complexes | Schiff-base | VLS3D

Engineering main heading: Synthesis (chemical)

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Original language: English

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Publisher: John Wiley and Sons Ltd

Raman, N.; Research Department of Chemistry, VHNSN College, Virudhunagar, India;

Document details - DNA fastening and scission actions of Cu(II), Co(II), Ni(II) and Zn(II) complexes: synthesis, spectral characterization and cytotoxic study

Applied Organometallic Chemistry

Volume 32, Issue 2, February 2018, Article number e4010

DNA fastening and scission actions of Cu(II), Co(II), Ni(II) and Zn(II) complexes: synthesis, spectral characterization and cytotoxic study(Article)

Kumaravel, G., Utthra, P.P., Raman, N.

Research Department of Chemistry, VHNSN College, Virudhunagar, Tamil Nadu 626 001, India

Abstract

A heterocyclic compound, 2-(aminomethyl)benzimidazole dihydrohydrochloride, was treated with nitrobenzaldehyde to form a Schiff base that was made to react with divalent metals. A co-ligand, either 1,10-phenanthroline or 2,2′-bipyridine, was added to this mixture to obtain metal chelators of type $[ML(co\text{-}L)_2]Cl_2$. They were in 1:1:2 stoichiometry ratio, which was characterized by various spectroscopic techniques that suggested an octahedral geometry around the central metal ions. These complexes were investigated for their binding affinities with calf thymus (CT) DNA, using various techniques, such as UV–Vis, viscosity, cyclic voltammetry (CV), etc. The binding interaction studies revealed intercalation as the possible binding mode of the complexes with the CT DNA. In addition, these complexes were screened for their antimicrobial potential and DNA denaturing tendencies using gel electrophoretic assay. The antimicrobial screening investigation showed that the complexes behaved as better antimicrobial agents than the ligand, especially, complex 5 shows exceptional activity even in the electrophoretic assay along with the antimicrobial efficacy. Moreover, complex 5 was able to denature the plasmid DNA better than the other compounds. All the compounds were screened for cytotoxic efficacy, and the IC_{50} values suggest that the compounds possess cytotoxic activity to some extent that is almost the same as the activity of cisplatin.

Author keywords

1,10-phenanthroline | benzimidazole | biological activity | cytotoxicity | Schiff base

Indexed keywords

Engineering controlled terms: Antimicrobial agents | Binding energy | Bins | Bioactivity | Cyclic voltammetry | Cytotoxicity | DNA | Ligands | Metal ions | Metals | Microorganisms | Platinum compounds | Spectrum analyzers | Synthesis (chemical) | Zinc compounds

Engineering uncontrolled terms: 1 ,10-phenanthroline | Antimicrobial screening | Benzimidazoles | Electrophoretic assay | Heterocyclic compound | Schiff-base | Spectral characterization | Spectroscopic technique

Engineering main heading: Cobalt compounds

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CODEN: AOCHE
Source Type: Journal
Original language: English

DOI: 10.1002/aoc.4010
Document Type: Article
Publisher: John Wiley and Sons Ltd

Raman, N.; Research Department of Chemistry, VHNSN College, Virudhunagar, Tamil Nadu, India;

Document details - Heteropoly acid supported on activated natural clay-catalyzed synthesis of 3,4-dihydropyrimidinones/thiones through Biginelli reaction under solvent-free conditions

Synthetic Communications

Volume 48, Issue 2, 17 January 2018, Pages 223-232

Heteropoly acid supported on activated natural clay-catalyzed synthesis of 3,4-dihydropyrimidinones/thiones through Biginelli reaction under solvent-free conditions(Article)

Selvakumar, K., Shanmugaprabha, T., Kumaresan, M., Sami, P.

Department of Chemistry, V.H.N. Senthikumara Nadar College (Autonomous), Virudhunagar, India

Abstract

Dihydropyrimidinones/thiones (DHPM's) have been prepared by one-pot condensation of methyl acetoacetate, aldehydes, urea/thiourea in the presence of heteropoly-11-tungsto-1-vanadophosphoric acid, $H_4[PVW_{11}O_{40}] \cdot 32H_2O$, (HPV) supported on activated natural clay (HPVAC) under solvent-free reaction condition have been proposed. The DHPM derivatives were identified through elemental analysis and melting point measurements and characterized by FT-IR, ^{1}H-NMR, ^{13}C-NMR spectroscopic methods. © 2017 Taylor & Francis.

Author keywords

3,4-Dihydropyrimidinones/thiones | heteropoly acid | multi-component synthesis | natural clay

Indexed keywords

EMTREE drug terms: 3,4 dihydropyrimidin 2(1h) one derivative | 3,4 dihydropyrimidin 2(1h) thione derivative | acetoacetic acid | aldehyde | benzaldehyde | phosphoric acid derivative | pyrimidinone derivative | solvent | thioketone | thiourea | unclassified drug

EMTREE medical terms: Article | Biginelli reaction | carbon nuclear magnetic resonance | catalyst | elemental analysis | infrared spectroscopy | melting point | one pot synthesis | polymerization | proton nuclear magnetic resonance | reaction analysis | reaction time

Chemicals and CAS Registry Numbers:

acetoacetic acid, 541-50-4, 623-58-5; benzaldehyde, 100-52-7; thiourea, 62-56-6

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Sami, P.; Department of Chemistry, V.H.N. Senthikumara Nadar College (Autonomous), Virudhunagar, India;

Document details - The design of novel visible light driven Ag/CdO as smart nanocomposite for photodegradation of different dye contaminants

Spectrochimica Acta - Part A: Molecular and Biomolecular Spectroscopy

Volume 188, 5 January 2018, Pages 291-300

The design of novel visible light driven Ag/CdO as smart nanocomposite for photodegradation of different dye contaminants(Article)

Saravanakumar, K., Muthuraj, V., Jeyaraj, M.

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Abstract

In this paper, we report a novel visible light driven Ag/CdO photocatalyst, fabricated for the first time via one pot hydrothermal method and further applied for the photodegradation of two important exemplar water contaminants, Malachite green and Acid Orange 7. The microstructure, composition and optical properties of Ag/CdO nanocomposites were thoroughly investigated by various techniques. Scanning electron microscopy clearly shows that Ag NPs were strongly embedded between the CdO nanoparticles. Among the series of synthesized Ag/CdO nanocomposites, (5%) Ag/CdO nanocomposite possesses enhanced photocatalytic activity. This result was attributed to the synergistic effect between Ag and CdO, and mainly Ag NPs can act as an electron trap site, which could reduce the recombination of the electron-hole and induce the visible light absorption. The active species trapping experiments implicate $^{[rad]}OH$ and $O_2^{[rad]-}$ radicals as the respective primary and secondary reactive species responsible for oxidative photodegradation of organic pollutants. On the basis of the results, a possible photocatalytic mechanism has also been proposed. © 2017

Author keywords

Ag/CdO | Hydrothermal method | Malachite green | Visible light photocatalyst

Indexed keywords

Engineering controlled terms: Carbonate minerals | Dyes | Nanocomposites | Optical properties | Organic pollutants | Photocatalysts | Scanning electron microscopy | Silver | Water pollution

Engineering uncontrolled terms: Hydrothermal methods | Malachite green | Oxidative photodegradation | Photocatalytic activities | Visible light absorption | Visible-light photocatalysts | Visible-light-driven | Water contaminants

Engineering main heading: Light

ISSN: 13861425
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Source Type: Journal
Original language: English

DOI: 10.1016/j.saa.2017.07.022
PubMed ID: 28734996
Document Type: Article
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Muthuraj, V.; National Centre for Nanoscience and Nanotechnology, University of Madras, Chennai, Tamil Nadu, India;

Document details - ¹H and ¹³C nuclear magnetic resonance spectroscopy

Spin Resonance Spectroscopy: Principles and applications

4 January 2018, Pages 49-110

^{1}H and ^{13}C nuclear magnetic resonance spectroscopy (Book Chapter)

Karunakaran, C., Santharaman, P., Balamurugan, M.

VHNSN College (Autonomous), Virudhunagar, India

Abstract

This chapter focuses on interpretation, assignment of chemical shifts including factors affecting it, additive rule for its calculation, spin-spin coupling, and comparison of $^{1}H$and ^{13}C nuclear magnetic resonance (NMR) spectroscopy. It also highlights symmetry in NMR systems and the effect of chirality on NMR. Spin decoupling and nuclear double resonance spectroscopy including single frequency off-resonance decoupling (SFORD), distortionless enhancement by polarization transfer (DEPT), insensitive nuclei enhanced by polarization transfer (INEPT), and chemically induced dynamic nuclear polarization for sensitivity enhancement (CIDNP) and spectral simplification are discussed. Nuclear Overhauser effect (NOE) enhances the signal intensity through space effect, and its mechanism and types are discussed. Multidimensional NMR viz., 2D and 3D for structure elucidation are also presented. The principles and advantages of 2D techniques viz., homonuclear ($^{1}H^{1}H$ viz., correlations spectroscopy, total correlation spectroscopy (TOCSY), nuclear Overhauser effect spectroscopy (NOESY), rotating frame nuclear Overhauser effect spectroscopy, exchange spectroscopy, $^{13}C^{13}C$: incredible natural-abundance double-quantum transfer experiment) and heteronuclear ($^{1}H^{13}C$ viz., heteronuclear multiple quantum correlation, heteronuclear single quantum coherence (HSQC), heteronuclear multibond connectivity are illustrated using examples. 3DNMR experiments constructed by combining the two 2D experiments viz., NOESY-HSQC, TOCSY-HSQC and triple resonance experiments using ^{1}H, ^{13}C, ^{15}N nuclei are also discussed. © 2018 Elsevier Inc. All rights reserved.

Author keywords

2D and 3D NMR | ^{13}C and ^{1}H NMR assignment | INEPT | NOE | Organic NMR | Symmetry in NMR

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Source Type: Book
Original language: English
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Document Type: Book Chapter
Publisher: Elsevier

Karunakaran, C.; VHNSN College (Autonomous), Virudhunagar, India

Chapters in this book

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7 chapters found in Scopus

- Principles of Nuclear Magnetic Resonance and Pulsed Nuclear Magnetic Resonance
- Preface
- ^{1}H and ^{13}C nuclear magnetic resonance spectroscopy
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- Applications of Electron Paramagnetic Resonance

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Document details - Applications of Electron Paramagnetic Resonance

Spin Resonance Spectroscopy: Principles and applications

4 January 2018, Pages 281-347

Applications of Electron Paramagnetic Resonance (Book Chapter)

Karunakaran, C., Balamurugan, M., Karthikeyan, M.

VHNSN College (Autonomous), Virudhunagar, India

Abstract

This chapter focuses on the applications of electron paramagnetic resonance (EPR) to transition metal complexes of d^1 ions including Ti^{3+}, Mo^{5+}, V^{4+}, d^3 ion Cr^{3+}, EPR of Mn^{2+} and parallel mode EPR of Mn^{3+}, EPR of interconversion of low-spin to high-spin iron complexes and rhombogram for its ground state, iron-sulfur exchange coupled clusters and heme containing proteins, EPR of low spin, high-spin octahedral and tetrahedral $Co^{2+/3+}$ complexes, and EPR of Nickel in+2,+3 and+1 oxidation states. EPR of Cu^{2+} and its proteins and Jahn-Teller coupling and its types viz., static and dynamic Jahn-Teller distortions, temperature dependence of Jahn-Teller effect, structural elucidation of bis-salicylaldimine-Cu(II) are discussed. Fast-flow, rapid freeze-quench EPR to direct monitoring of free radicals and indirectly by spin traps, types, and applications of spin traps are presented. Electron spin resonance spin labeling, dosimetry, imaging, spin probes in EPR imaging, invivo EPR imaging, Overhauser enhanced magnetic resonance imaging, and proton electron double resonance imaging are also described.

Author keywords

EPR imaging | EPR of transition metal ions and their proteins | Fast-flow and rapid freeze-quench EPR | Rhombogram | Spin labeling | Spin traps

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Karunakaran, C.; VHNSN College (Autonomous), Virudhunagar, India

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Document details - Spin resonance spectroscopy: Principles and applications

Spin Resonance Spectroscopy: Principles and applications

4 January 2018, Pages 1-378

Spin resonance spectroscopy: Principles and applications (Book)

Karunakaran, C.

Biomedical Research Lab, VHNSN College (Autonomous), Virudhunagar, Tamilnadu, India

Abstract

Spin Resonance Spectroscopy: Principles and Applications presents the principles, recent advancements and applications of nuclear magnetic resonance (NMR) and electron paramagnetic resonance (EPR) in a single multi-disciplinary reference. Spin resonance spectroscopic techniques through NMR and EPR are widely used by chemists, physicists, biologists and medicinal chemists. This book addresses the need for new spin resonance spectroscopy content while also presenting the principles, recent advancements and applications of NMR and EPR simultaneously. Ideal for researchers and students alike, the book provides a single source of NMR and EPR applications using a dynamic, holistic and multi-disciplinary approach. © 2018 Elsevier Inc. All rights reserved.

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Karunakaran, C.; Biomedical Research Lab, VHNSN College (Autonomous), Virudhunagar, Tamilnadu, India

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- Principles of Nuclear Magnetic Resonance and Pulsed Nuclear Magnetic Resonance
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- Applications of Nuclear Magnetic Resonance
- Electron Paramagnetic Resonance Spectroscopy
- Advances in Electron Paramagnetic Resonance
- Applications of Electron Paramagnetic Resonance

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Sudheeshna, M. , Malarvannan, M. , Kumar, K.V.

2D Chromatography and 2D Spectroscopy in Analytical Chemistry: an Overview

(2023) Journal of Analytical Chemistry

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(2021) Scientific Reports

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Document details - Advances in Electron Paramagnetic Resonance

Spin Resonance Spectroscopy: Principles and applications

4 January 2018, Pages 229-280

Advances in Electron Paramagnetic Resonance (Book Chapter)

Karunakaran, C., Balamurugan, M.

VHNSN College (Autonomous), Virudhunagar, India

Abstract

This chapter deals with the recent advances in electron paramagnetic resonance (EPR) methods especially using multifrequency including low- and high-field EPR on Zero-Field Splitting, g-anisotropy, and role in invivo EPR spectroscopy. It also includes advances in pulsed-EPR using electron spin echo, field-swept, echo-detected, saturation recovery EPR for measurement of electron spin-relaxation times. Time-resolved and rapid-scan EPRs are discussed to study the unstable free radicals intermediates. The theory and application of multipulse EPR, viz., electron spin echo envelope modulation (ESEEM) including two-pulse ESEEM, three-pulse ESEEM, and two-dimensional hyperfine sublevel correlation (HYSCORE) are discussed. Furthermore, multiresonance EPR techniques viz., electron-nuclear double resonance (ENDOR), continuous wave (CW) ENDOR, Pulsed ENDOR and its types, Davies ENDOR, and Mims ENDOR are described. In addition, electron-electron double resonance (ELDOR) CW and pulsed ELDOR or double electron-electron resonance for distance measurements are presented.

Author keywords

DEER ELDOR ENDOR ESEEM HYSCORE Multifrequency EPR Time resolved TRIPLE

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Karunakaran, C.; VHNSN College (Autonomous), Virudhunagar, India

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Document details - Principles of Nuclear Magnetic Resonance and Pulsed Nuclear Magnetic Resonance

Spin Resonance Spectroscopy: Principles and applications

4 January 2018, Pages 1-42

Principles of Nuclear Magnetic Resonance and Pulsed Nuclear Magnetic Resonance
(Book Chapter)

Karunakaran, C., Rajkumar, R., Balamurugan, M.

VHNSN College (Autonomous), Virudhunagar, India

Abstract

Spin resonance spectroscopy deals with the nuclear and electron spin resonance absorptions in the radio and microwave frequencies used for investigating diamagnetic (I. ≥. 1/2) and paramagnetic (S. ≥. 1/2) systems, respectively. This chapter focuses on the theory of nuclear magnetic resonance (NMR), its instrumentation, and comparison with electron paramagnetic resonance spectroscopy. The parameters obtained from NMR viz., chemical shift and spin-spin splitting including their types (first and second orders), characteristics, and mechanisms (dipolar and indirect scalar coupling) are discussed. Furthermore, the classification of NMR systems including chemically and magnetically equivalent nuclei is presented. The simplification techniques for complex NMR spectra are also highlighted. It also includes the principles of pulse and Fourier transform NMR and different methods viz., free induction decay, saturation recovery, spin echo (SE), inversion recovery, and stimulated SE to investigate the relaxation process and times. The time evolution of magnetization is described by Bloch equation. The different lineshapes and factors affecting line width are also discussed. © 2018 Elsevier Inc. All rights reserved.

Author keywords

Chemical shift | Coupling constant | FID | Lineshape and line width | NMR spin system | Relaxation times | Spin echo

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Karunakaran, C.; VHNSN College (Autonomous), Virudhunagar, India

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Wiström, E. , Hyacinthe, J.-N. , Lê, T.P.

^{129}Xe Dynamic Nuclear Polarization Demystified: The Influence of the Glassing Matrix on the Radical Properties

(2024) Journal of Physical Chemistry Letters

de Melo, D.F. , Guedes, G.G. , Moreira, L.M.C.C.

Physicochemical Characterization of Silver Sulfadiazine in Polymeric Wound Dressings

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Document details - Electron Paramagnetic Resonance Spectroscopy

Spin Resonance Spectroscopy: Principles and applications

4 January 2018, Pages 169-228

Electron Paramagnetic Resonance Spectroscopy (Book Chapter)

Karunakaran, C., Balamurugan, M.

VHNSN College (Autonomous), Virudhunagar, India

Abstract

Electron paramagnetic resonance (EPR) is the only unambiguous technique to investigate directly the free radicals and paramagnetic compounds viz., transition metal ions, triplet states, etc. So, in this chapter, the principles of EPR, instrumentation (parallel and perpendicular modes), and presentation of spectra are discussed. The Spin Hamiltonian equation used to describe the EPR spectra and parameters are explained. The determination of g-values including factors affecting its magnitude, reference samples, isotropic hyperfine interaction, EPR of hydrogen atom, and free radicals in solution are presented. g- and A-tensor anisotropy, zero-field splitting, Kramer's theory and degeneracy, exchange-coupled EPR, half-field transition, and triplet-state EPR are highlighted. Optically Detected Magnetic Resonance (ODMR), a double resonance technique for studying triplet states is also discussed. The effect Jahn-Teller (JT) coupling/distortion on EPR and optical spectra, its types, consequences, and applications of JT are presented. A brief account and useful list of computer simulation software are also given. © 2018 Elsevier Inc. All rights reserved.

Author keywords

Exchange coupled | Half-field transition | JT coupling | Kramer's theory | ODMR | Simulation | Spin Hamiltonian | Triplet | Zero-field

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Karunakaran, C.; VHNSN College (Autonomous), Virudhunagar, India

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Document details - Preface

Spin Resonance Spectroscopy: Principles and Applications

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Preface (Editorial)

Karunakaran, C.

VHNSN College (Autonomous), Virudhunagar, India

Abstract

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Karunakaran, C.; VHNSN College (Autonomous), Virudhunagar, India

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Document details - Biogenic approaches for SiO₂ nanostructures: Exploring the sustainable platform of nanofabrication

Green and Sustainable Advanced Materials: Volume 1: Processing and Characterization

1 January 2018, Pages 107-141

Biogenic approaches for SiO_2 nanostructures: Exploring the sustainable platform of nanofabrication
(Book Chapter)

Hariram, M., Vishnukumar, P., Vivekanandhan, S.

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[b]Department of Physics, Alagappa University, Karaikudi, Tamil Nadu, India

Abstract

Silica is one of the most common metal oxides, which has been explored for many potential applications. When its size reduced to nano, unique physicochemical properties were appeared, which received extensive scientific and technological importance in many fields including optics, catalysis, drug delivery, and biomedical imaging. As the demand for SiO_2 nanostructures expands in many areas, the synthetic process plays a vital role in order to meet the specific requirements. A wide range of physical and chemical processes have been established and reported; however, there is a need for the sustainable greener alternative. Research and development activities have been promoted for the synthesis of SiO_2 nanostructures employing biological resources including bacteria, fungus, plants, and other bio-substances. Apart from the synthesis, the biogenic processes have also been explored for the modification of SiO_2 nanostructures to improve/create their functional properties. This chapter describes the recent developments in the biogenic approaches for SiO_2 nanostructures as well as their potential applications. © 2018 Scrivener Publishing LLC.

Author keywords

Bio templates | Biosilica | Functionalized silica | Plant extract | Rice husk

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Document Type: Book Chapter
Publisher: wiley

Vivekanandhan, S.; Sustainable Materials and Nanotechnology Lab (SMNL), Department of Physics, VHNSN College, Virudhunagar, Tamil Nadu, India;

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- Biogenic approaches for SiO2 nanostructures: Exploring the sustainable platform of nanofabrication
- Green and sustainable advanced composite materials
- Design and processing aspects of polymer and composite materials
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Document details - Investigation of A-X band system of astrophysically significant molecule BS

Journal of Physical Science

Volume 29, Issue 1, 2018, Pages 133-140

Investigation of A-X band system of astrophysically significant molecule BS(Article)(Open Access)

Balasubramanian, K., Ganesan, S., Narayanan, R.

[a]Department of Physics, Mepco Schlenk Engineering College, Sivakasi, 626005, India
[b]Department of Physics, V.V.Vanniaperumal College for Women, Virudhunagar, 626001, India
[c]Physics Research Centre, VHNSN College, Virudhunagar, 626001, India

Abstract

It is widely known that molecular signatures in celestial object play a vital role in deriving the physical conditions of the object using spectroscopic technique. The present study therefore focuses on the evaluation of Franck-Condon factors (FCFs) and r-centroids for the A-X band system of Boron mono-sulphide (BS) molecule by a numerical integration method using the suitable potential. With the help of FCFs and r-centroids, the vibrational temperature of the source is estimated and is found to be about 6893 K. The vibrational temperature estimated in the present study reveals that the rotational temperature of the molecule has to be considered for the identification of the chosen band system in the astrophysical spectra. The vibration rotation interaction (VRI) effect for the chosen band system is discussed. It is found that the VRI effect may influence the effective temperature of the source and hence the effect of VRI has to be considered at the time of identifying the BS molecular lines in the spectra of sunspot or any celestial object. © Penerbit Universiti Sains Malaysia, 2018.

Author keywords

BS molecule | Franck-Condon factors | R-centroids | Sunspot | Vibrational temperature

Indexed keywords

Engineering controlled terms: Band structure | Numerical methods | Sulfur compounds

Engineering uncontrolled terms: Franck-Condon factors | Numerical integration methods | R-centroids | Rotational temperature | Spectroscopic technique | Sunspot | Vibration-rotation interactions | Vibrational temperature

Engineering main heading: Molecules

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Document Type: Article
Original language: English
Publisher: Penerbit Universiti Sains Malaysia

Balasubramanian, K.; Department of Physics, Mepco Schlenk Engineering College, Sivakasi, India;

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Document details - Classification of Dengue Gene Expression Using Entropy-Based Feature Selection and Pruning on Neural Network

Advances in Intelligent Systems and Computing

Volume 736, 2018, Pages 519-529

17th International Conference on Intelligent Systems Design and Applications, ISDA 2017; Delhi; India; 14 December 2017 through 16 December 2017; Code 212209

Classification of Dengue Gene Expression Using Entropy-Based Feature Selection and Pruning on Neural Network(Conference Paper)

Pandiyarajan, P., Thangairulappan, K.

[a]Department of Computer Science, Ayya Nadar Janaki Ammal College, Sivakasi, Tamilnadu 626124, India
[b]Research Centre in Computer Science, V.H.N.Senthikumara Nadar College, Virudhunagar, Tamilnadu 626001, India

Abstract

Dengue virus is a growing problem in tropical countries. It serves diseases, especially in children. Different diagnosing methods like ELISA, Platelia, haemocytometer, RT-PCR, decision tree algorithms and Support Vector Machine algorithms are used to diagnose the dengue infection using the detection of antibodies IgG and IgM but the recognition of IgM is not possible between thirty to ninety days of dengue virus infection. These methods could not find the correct result and needs a volume of the blood. It is not possible, especially in the children. To overcome these problems, this paper proposes classification method of dengue infection based on informative and most significant genes in the gene expression of dengue patients. The proposed method needs only gene expression for a patient which is easily obtained from skin, hair and so on. The classification accuracy has been evaluated on various benchmark algorithms. It has been observed that the increase in classification accuracy for the proposed method is highly significant for dengue gene expression datasets when compared with benchmark algorithms and the standard results. © 2018, Springer International Publishing AG, part of Springer Nature.

Author keywords

Classification | Dengue diagnosis | Dengue infection | Feature selection | Neural network | Pruning

Indexed keywords

Engineering controlled terms: Chemical detection | Classification (of information) | Computer aided diagnosis | Data mining | Decision trees | Feature extraction | Intelligent systems | Neural networks | Systems analysis | Viruses

Engineering uncontrolled terms: Classification accuracy | Classification methods | Decision-tree algorithm | Dengue infection | Gene expression datasets | Pruning | Support vector machine algorithm | Tropical countries

Engineering main heading: Gene expression

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Pandiyarajan, P.; Department of Computer Science, Ayya Nadar Janaki Ammal College, Sivakasi, Tamilnadu, India;

Document details - Fingerprint Image Enhancement Using Steerable Filter in Wavelet Domain

Advances in Intelligent Systems and Computing

Volume 736, 2018, Pages 315-325

17th International Conference on Intelligent Systems Design and Applications, ISDA 2017; Delhi; India; 14 December 2017 through 16 December 2017; Code 212209

Fingerprint Image Enhancement Using Steerable Filter in Wavelet Domain(Conference Paper)

Jeyalakshmi, K.S., Kathirvalavakumar, T.

[a]Department of Computer Science, N.M.S.S.Vellaichamy Nadar College (Autonomous), Madurai, 625 019, India
[b]Research center in Computer Science, V.H.N.S.N. College (Autonomous), Virudhunagar, 626 001, India

Abstract

The proposed work is to enhance the features of the fingerprint image using steerable filter in wavelet domain to increase the accuracy and speed of Automatic fingerprint identification system. The proposed method uses steerable filter and wavelet. The steerable filter allows filtering process adaptively to any orientation and determining analytically the filter output as a function of orientation and the wavelet domain speeds up the computation process. The steerable filter is applied on each local blocks of approximation image of wavelet transform for tuning up the fingerprint image features and then smoothing the resultant which leads to enhanced image. Experiments are conducted on FVC databases and results show that enhancement process reveals clear visualization of fingerprint images. © 2018, Springer International Publishing AG, part of Springer Nature.

Author keywords

Fingerprint enhancement | Multi-scale pyramid decomposition | Orientation field | Principal component analysis | Steerable filter | Wavelet transform

Indexed keywords

Engineering controlled terms: Adaptive filtering | Bandpass filters | Biometrics | Image compression | Intelligent systems | Principal component analysis | Systems analysis | Wavelet decomposition | Wavelet transforms

Engineering uncontrolled terms: Automatic fingerprint identification systems | Computation process | Fingerprint enhancement | Fingerprint image enhancement | Fingerprint images | Multi-Scale pyramids | Orientation fields | Steerable filters

Engineering main heading: Image enhancement

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Document details - Design and Fabrication of a Novel Metal-Free SiO₂/g-C₃N₄ Nanocomposite: A Robust Photocatalyst for the Degradation of Organic Contaminants

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Design and Fabrication of a Novel Metal-Free $SiO_2/g\text{-}C_3N_4$ Nanocomposite: A Robust Photocatalyst for the Degradation of Organic Contaminants(Article)

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Abstract

Abstract: Development of novel and efficient nanostructured materials for the waste water treatment is a great challenge for the researchers. In this regard, we report a novel $SiO_2/g\text{-}C_3N_4$ nanocomposites were tailored via simple solvothermal route and characterized by various spectroscopic and microscopic techniques such as XRD, FT-IR, UV–Vis DRS, SEM, TEM and XPS. The photocatalytic performances of the as-prepared $SiO_2/g\text{-}C_3N_4$ nanocomposites were evaluated for the removal of hazardous rhodamine B (RhB) and crystal violet (CV) organic dyes in aqueous solution under visible light irradiation. Interestingly, the UV–Visible spectroscopy results revealed that the as-synthesized $SiO_2/g\text{-}C_3N_4$ nanocomposite showed superior photocatalytic activity for the degradation of RhB and CV dyes could degrade 99 and 98% under visible-light irradiation respectively. The enhanced photocatalytic activity of $SiO_2/g\text{-}C_3N_4$ nanocomposites could be mainly attributed to the proficient separation of photo-induced charge carriers. A plausible degradation mechanism for the controlled visible-light photocatalytic activity of $SiO_2/g\text{-}C_3N_4$ nanocomposites was strongly evidenced by the trapping experiment by employing different scavengers. The present research findings may open up a new platform for the $g\text{-}C_3N_4$ based photocatalyst for the degradation of organic pollutants. Graphical Abstract: Proposed degradation mechanism of the $SiO_2/g\text{-}C_3N_4$ photocatalyst.

Author keywords

Scavenger | $SiO_2/g\text{-}C_3N_4$ nanocomposite | Solvothermal synthesis | Visible-light photocatalyst

Indexed keywords

Engineering controlled terms: Degradation | Dyes | Image enhancement | Irradiation | Light | Nanocomposites | Organic pollutants | Photocatalysis | Photocatalysts | Rhodium compounds | Silica | Solutions | Stripping (dyes) | Waste treatment | Wastewater treatment | Water treatment

Engineering uncontrolled terms: Degradation of organic contaminants | Photocatalytic activities | Photocatalytic performance | Scavenger | Solvothermal synthesis | Spectroscopic and microscopic techniques | Visible light photocatalytic activity | Visible-light photocatalysts

Engineering main heading: Photodegradation

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Document details - Synthesis of innovative biochemical active mixed ligand metal(II) complexes with thiazole containing Schiff base: In vitro antimicrobial profile

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Synthesis of innovative biochemical active mixed ligand metal(II) complexes with thiazole containing Schiff base: In vitro antimicrobial profile(Article)

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Abstract

An unique Schiff base ligand, formed by the condensation reaction of 2-aminobenzothiazole with curcumin and its Cu(II), Ni(II), Co(II) and Zn(II) complexes incorporating 2,2′-bipyridine as coligand were synthesised. They were characterized via analytical and spectroscopic methods. The complexes adopt square planar geometry. Their antimicrobial activity and photocatalytic efficiency on Congo red dye molecule were explored. It is found that all the complexes are antimicrobial active and show higher activity than the ligand. The nuclease activity of the above metal complexes was also assessed by absorption titration, fluorescence, viscosity and gel electrophoresis assay. The complexes bind CT DNA through intercalation mode. The data reveal that the above synthesised metal(II) complexes are found to be effective metallonucleases. The gel electrophoresis results exhibit that the metal complexes cleave pBR322 plasmid DNA in presence of hydrogen peroxide effectively compared to the ligand. The synthesised metallonucleases should lead to a new era for the logical sketch of dominant agents for probing and targeting nucleic acids. This exploration reveals that Cu(II) complex has a valued biological and photochemical profile. Copyright © 2017 John Wiley & Sons, Ltd.

Author keywords

2,2′-bipyridine | antimicrobial activity | DNA binding and cleavage studies | Schiff bases

Indexed keywords

Engineering controlled terms: Azo dyes | Bins | Chelation | Cobalt compounds | Condensation reactions | DNA | Electrophoresis | Geometry | Ligands | Metal complexes | Metals | Microorganisms | Nucleic acids | Spectroscopic analysis | Zinc compounds

Engineering uncontrolled terms: 2 ,2'-Bipyridine | 2-aminobenzothiazoles | Anti-microbial activity | DNA binding and cleavages | Photocatalytic efficiency | Schiff basis | Spectroscopic method | Square planar geometry

Engineering main heading: Synthesis (chemical)

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