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A-01

**EFFECT OF DIFFERENT MICROBIAL
TREATMENTS ON GERMINATION,
SEEDLING GROWTH AND
OTHER QUALITY PARAMETERS
OF MAIZE (*ZEA MAYS L.*)**

**AZAD AHMAD WANI, JAYA JOSHI
AND ANURAG TITOV**

Maize (*Zea mays L.*) is one of the most important cereals of the world as a source of energy and carbohydrates in the human diet and as raw material for large no. of industrial products. It is a versatile, miracle crop and thus termed as "King of cereals" because of its productivity potential compared to any other cereal crop. At global level, India ranks 4th in area and 7th in production of maize. The area, production and productivity of maize in India were 8.6mha, 20.5mt and 2.4 t/ha, respectively in 2010-11 (Annual report Directorate of Maize Research, 2011-12).

Seed is a living entity and is subjected to environmental stresses which affect the quality. Despite the high yielding potential and various advantages of maize, yield per unit area of the crop is low in India because production is decreasing due to various reasons like delays in germination and low seed viability but the most important reason is low fertility of the soil. It is unquestionable that proper seed treatment measures can sustainably improve the seed quality parameters. Farmers saved seeds provide lower germination rate, however upon treatment significant increase in seed germination rate was obtained by various workers.

The green revolution has led to intensified agriculture to meet the ever increased demands globally. Amplified use of chemicals breaks down the natural ecological balance by killing the beneficial

EFFECT OF SHORT TERM YOGA ON KIDS

**BABITA SINGH, ANURAG TITOV
AND RADHESHYAM MISHRA**

Human is the most important resource for any nation and children take the top most position as they are the future prospects of the nation. Modern education systems provide knowledge to a great extent but most of the time fails to impart character building and moral values during the developmental phase of their lives.

Childhood is the time for development and growth when the child develops habits and the lifestyle is molded. The child is full of energy which needs to be expressed in a proper direction. We often view children simply as small versions of adults not considering the physical and mental development process that occurs during childhood and adolescence. An understanding of child development is essential, to fully understand the cognitive, emotional, physical, social and educational growth of them but it was largely ignored throughout history. Interest in the field of child development began to emerge early in the 20th century which mainly involved their abnormal behavior. Later on typical child development as well as the influences of various factors on child development was also studied.

In most of the Child Development Theories, development is considered a reaction to rewards, punishments, stimuli and reinforcement. It gives no consideration to internal thoughts or feelings. Instead, it focuses purely on how experience shapes who we are.

Materials and Methods

In order to prove this aspect of yoga in reality, a special 'Case Study Program' was organized with 35 children (age group 5 – 12 years) for a period of 3 months. During the first month the regular yoga class was organized in which they learned the technique of

A COMPARATIVE STUDY OF BIOCHEMICAL OXYGEN DEMAND (BOD) WITH ULTRAVIOLET SPECTROPHOTOMETRY AND STANDARD PROCEDURES

DEEPENDRA SINGH RAGHUVANSI AND P.B. REDDY

The majority natural water bodies have minute quantities of organic compounds. Certain microbes present in the water use some of these compounds as source of food. They degrade these organic compounds by the process of oxidation using dissolved oxygen (DO) present in the water. Thus the metabolism of microorganisms generates an oxygen demand proportional to the amount of organic compounds useful as food. Occasionally microbial metabolism can consume dissolved oxygen (DO) faster than atmospheric oxygen can dissolve into the water which may cause death of aquatic organisms due to depletion of oxygen in water (Goldman, Charles R. and Horne, Alexander, J, 1983).

Biochemical oxygen demand occurs over some inconsistent period of time depending on temperature, nutrient concentrations, and the enzymes available to native microbial populations. The amount of oxygen required to completely oxidize the organic compounds to carbon dioxide and water through generations of microbial growth, death, decay, and cannibalism is total biochemical oxygen demand (total BOD). The overall BOD is of more importance to food webs than to water quality. If the micro organisms deoxygenate the water, the lack of oxygen enforces a limit on population growth of aerobic aquatic microbial organisms resulting in a longer term food excess and oxygen scarcity (Reid, George K, 1961).

BOD can be measured by standard dilution method (Lenore S, et al, 2005). On 5-day BOD, dilution method. BOD waste is one of the hazardous waste that contains high amount of heavy metals and toxic

CURRENT STATUS AND FUTURE CHALLENGES OF RESEARCH AND INNOVATION IN ANALYTICAL CHEMISTRY IN INDIA

P.B. REDDY AND DEEPENDRA SINGH

India has a great history of scientific research and achievement. Since independence, there has been a shown effort to generate reliable scientific research infrastructure and institutions, even though this attempt has not kept pace with rapidly evolving scientific objectives. Global Innovation Index 2013 places India at the 66th position amongst 142 nations. In scientific research, while India's contribution to the global output has increased, it still remains only at a modest level with no sign of a major upward swing in quantity or quality. Despite the fact that India is progressing, others are moving in front faster. Thus, some of our neighboring countries have spent much more in people, institutions and infrastructure, and returned the benefits of science, technology and innovation (STI) to achieve spectacular economic growth and to provide for better education and health-care, and have moved ahead quickly towards becoming members of the developed world. India's performance in research and innovation has also not been overall satisfactory, and we have very few institutions that can be found in the top class in international positions. Obviously, we have to make a serious attempt to recover the situation, if we have to move towards becoming a global competitor. The total annual expenses on science and technology is now close to 0.8% of the Gross National Product (GNP). If the government's dream at present is to be believed, the size of the education sector will grow almost 10-fold during the current XII Five-Year Plan. Given these projections in the R&D sector in the country, S&T infrastructure in India is certain to witness significant expansion too in the near future.

CONVENTIONAL AND MICROWAVE INDUCED SYNTHESIS OF BI (III) COMPLEXES WITH BENZIMIDAZOLE DERIVATIVES OF SUBSTITUTED PYRIMIDINE

A.M. CHATURVEDI, Y.K. MISHRA
AND VANDANA RAJAWAT

Pyrimidine is a heterocyclic organic compound containing two nitrogen atoms at position 1 and 3 of the six membered ring. They possess a broad spectrum of biological activities such as antimalarial, antitumoral, antiviral, anticancer, antibacterial, anti-inflammatory, antitubercular and antihypertensive. The pyrimidine nucleus is an important structure in synthetic and medicinal chemistry.

Benzimidazole derivatives are known to possess antifungal, antibacterial, antiviral, anti-inflammatory, antidepressive, and antipyretic activities.

The synthesis of heterocyclic organic ligands which preferentially interact with particular metal ions has fundamental importance in many areas of Chemistry. Heterocycles containing two or more donor atoms play an important role in the study of ambidentate ligand system. Heterocyclic diazine such as pyrimidine is known to act as bidentate ligand when coordinated with metal ions.

Experimental

All chemicals used were of analytical grade (AR), from Loba, Merk, and SD-Fine, most of them were used as received, without further purification, while some of them were purified and dried through standard procedures, before use throughout the work. Ethanol (Qualigens, b.p. 78°C) was refluxed over freshly ignited calcium oxide

PHOTODEGRADATION OF TOLUIDINE BLUE DYE IN AN AQUEOUS SOLUTION BY A BISMUTH MOLYBDATE PHOTOCATALYST

BRIJESH PARE, VIJENDRA SINGH, PREMLATA GUPTA,
SUNIL YADAV AND DEEPAK MALVIYA

Dyes are widely used in the chemical, textile and leather industry. Dyes are also applied to the manufacture of accelerators, antioxidants, pesticides and pigments. The negative effects of dyes on human health and the environment are depending on the amount and exposure time. Dyes can enter the aqueous environment via dyes and nitro aromatic compounds and has been identified as a potential carcinogen. Now days, more attention is focused to remove it from environment¹. Among chemical methods, photocatalysis technology can play an important role in removing harmful organic dyes, which enables human to have comfortable and safe lives. Being the most common photocatalyst among semiconductors, TiO_2 possesses various merits such as low cost, high photocatalytic activity, chemical activity, and nontoxicity. As its photoresponse is only limited in the UV region, which accounts for less than 5% of the earth-reaching solar irradiation, it requires a high power UV excitation source. Therefore, it is meaningful to explore a new photocatalyst which can utilize visible light. Bi_2MoO_6 is a new efficient photocatalyst, have band gap of 2.70 eV. Their results indicate that Bi_2MoO_6 showed a higher photocatalytic activity towards Toluidine blue compared to some other visible light-sensitive semiconductor compounds, such as TiO_2 and ZnO^2 etc. In this study, Toluidine blue was chosen as the target organic pollutant to investigate its degradation behavior over Bi_2MoO_6 under visible light irradiation. Process conditions are optimized by

DECOLORIZATION AND MINERALIZATION OF HAZARDOUS BRILLIANT CRESYL BLUE DYE UTILIZING VISIBLE LIGHT AND TiO_2 AS PHOTOCATALYST

BRIJESH PARE AND DAVID SWAMI

Paper, rubber, cosmetics, leather, ink, dyeing, plastic and textile industries use color for dyeing their products and thus use a huge amount of water which results in the production of dye-containing wastewater with hazardous effects on the environment. Dye containing wastewater produces huge amount of polluted effluents that are normally discharged on the surface water bodies and ground water receiving surface water capacity and causes a lot of disturbance to the ground water resources (Iqbal M.J. et al. 2007). TiO_2 photocatalytic degradation technique has large capability for wastewater treatment. Among the new methods of colorful wastewater treatment TiO_2 photocatalysis based on the generation of very reactive species such as hydroxyl radicals have been proposed to oxidize quickly and none selectively a broad range of organic pollutants (Sano T. et al. 2008).

IMPACT OF AIR POLLUTION ON THE ASCORBIC ACID CONTENT OF SOME ROAD SIDE TREES OF UJJAIN

MADHU PUROHIT AND RANJANA GUPTA

Urban air pollution has become a serious environmental problem to tree and crops (Chauhan and Joshi, 2008). Plant organs are exposed to the atmosphere and the leaves continuously exchange gases so pollutants are reflected by the plant health. Therefore, plants can be effectively used as bio-indicators of urban air quality as well as beautification agents (Mondal, 2011). Impact of air pollution on plants is a time-averaged result that is more reliable than the one obtained from direct determination of the pollutants in air over a short period. A large number of trees and shrubs have been identified as dust filters to check rising urban dust pollution level (Rai, 2010). Plants provide an enormous leaf area for impingement, absorption and accumulation of air pollutants to reduce the pollution level in the air with various extents for different species (Liu and Ding, 2008). Shrubs play important role in monitoring and maintaining the ecological balance by actively participating in the cycling of nutrients and gases like carbon dioxide, Oxygen and also provide enormous leaf area for impingement, absorption and accumulation of pollutants to reduced the pollution level in the air environment (Escobedo, 2008). As such, one possible approach is to plant appropriate plants and shrubs at strategic locations such as in towns and along the road sides. Plant selection criteria should not only be limited to colorful flower and leaves, robustness, watering issues and space but it should also be able to improve air quality (Nugrahari, 2012).

Ascorbic acid may be used to decide the tolerance of plant to air pollution. It plays a significant role in light reaction of photosynthesis (Sing and verma, 2007), activates defense mechanism

DEHYDROGENASE ACTIVITY AS AN INDICATOR OF SOIL POLLUTION

P. DWIVEDI AND H.S. DWIVEDI

Soil enzymatic activities play a key role in soil nutrient cycling and transformation of organic matter. It is an indicator of microbial population of the soil. Soil quality changes as a result of environmental stress or other practices. It is an important aspect of below ground processes and gives an inside in to the relative changes in the below ground system. Enzymatic activity in soil is a result of the activity of accumulated enzymes and the enzymatic activity of microorganisms. Soil enzyme analysis helps to establish correlation with soil fertility, microbial activity, biochemical cycling and degree of pollution. Enzymatic activity is used as an index of soil productivity or microbial activity.

Over the past few decades, the use of pesticides in the agriculture fields has resulted in their undesirable accumulation in the environment. A significant amount of these compounds have been frequently detected in different levels of ecosystem like water, soil.

Dehydrogenase activity is a measure of the intensity of microbial metabolism in soil and thus the microbial activity of soil. The objective of the present work is to study the effects of herbicide residues on soil microbial activities through soil dehydrogenase activity.

Material and Method

Black cotton soil was used for studying the effect of herbicide. Composite samples of top 10 -15 cm soil were collected from the field. It was thoroughly sieved and then herbicidal treatment was given.

Herbicide atrazine, primarily used herbicide for agricultural purposes. It is selective systemic and used as pre and post emergent herbicide to control annual broad leaved weeds and perennial grasses.

DNA BINDING AFFINITY OF SOME USED MIXED LIGAND METAL COMPLEXES OF COPPER AND COBALT AND CHROMIUM

PRATIBHA NAMDEO

Identifying molecules that intercalate into DNA helices has attracted considerable interest over the last few decades. Compounds showing the property of effective binding as well as cleaving double stranded DNA under physiological conditions are of importance since these could be used as diagnostic agents in medicinal and genomic research.

Transition metal complexes that efficiently bind and cleave DNA under physiological conditions have found wide applications in the nucleic acid chemistry as foot printing and sequence specific binding agents, for modelling the restriction enzymes in genomic research, and as new structural probes in diagnostic medicinal applications for the treatment of cancer. In the past decade, a variety of cationic metal complexes have been utilized to develop novel probes of DNA, new therapeutic agents which can recognize and cleave DNA, and DNA mediators of electron transfer reactions.

Recently interest possessed in Cu(II) complexes are increasing due to their possible medical uses as antitumour agent and bioactive ligands involving natural product ligands have been applied for the design of Cu-coordination novel drugs for that naturally occurring compounds have served as a major source of drugs for century.

Copper is among the most widely used metals in these studies, since it was demonstrated that $[\text{Cu}(\text{phen})_2]^{2+}$ (phen = 1,10-phenanthroline) is able to break the DNA chain in the presence of H_2O_2 . Cobalt was accepted as an essential metal element widely distributed in the biological systems such as cells and body, and thus the interaction of DNA with cobalt complex has attracted much

A COMPARATIVE STUDY OF VARIOUS FRUITS AS POTENTIAL SOURCE OF LYCOPENE AND THEIR PROPERTIES BY USING UV SPECTROPHOTOMETER

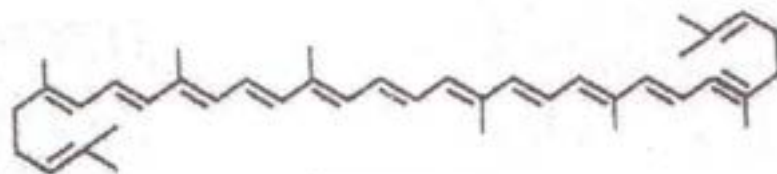
NEELU MALVIYA AND SAROJ MAHAJAN

Lycopene belongs to carotenoid which is a natural pigment. It protects the body from oxidants which gives destructive effects. Recent studies shows that in comparison with beta carotene, lycopene had more potential to counter free radicals. Natural products are rich sources of anti-oxidants. The protective effect has been attributed to carotenoid; it is the major class of phytochemical. Carotenoids are a family of compounds over 600 fat- soluble plant pigments which provide various colours we see in nature.

Fruits and vegetables are good source of natural anti-oxidants. These anti-oxidants reduce risk of cancer and heart diseases and also provide various health benefits. Lycopene is synthesized by plants and microorganisms. Animals get lycopene from red fruits and vegetables. In vitro studies have shown that Lycopene is able to protect lipids, DNA and proteins from oxidative damage.

Good amounts of lycopene contained in many natural fruits like tomato, watermelon, red pepper, papaya, guava etc. This molecule is also responsible for the red colour of these vegetables.

Lycopene has a long chain structure that consists of conjugated double bonds, with open end rings. The structure of lycopene is the longest of all carotenoid.



Lycopene

ISOLATION AND IDENTIFICATION OF ALIPHATIC COMPOUNDS FROM THE BENZENE EXTRACT OF *PIPER-BETLE* LINN. (LEAF STALK)

NISAR AHMAD, B.K. TIWARI AND ARPAN BHARDWAJ

Piper betle Linn. (Local name 'Pan') belongs to family *piperaceae*, a dioecious, perennial creeper, climbing by many short adventitious rootlets, widely cultivated in hotter and damper parts of the country is wide spread in damp forests and is cultivation in India and other countries in South East Asia, such as Vietnam and China. A concoction of indigenous Indian drugs, containing *P. betle* dry extract was found to be an effective long-lasting oral contraceptive (1). The flowers of this area used as ingredient for the chewing food known as betle quid in South-East Asia (2). Mouthwashes and tablets containing pulverized betle nut were used for the treatment of dental and periodontal diseases (3). Betel leaves were reported to have high antioxidant effects (4,5), antidiabetic (6), Radio protective (7), Antibacterial effect (8), Pro-apoptotic effect (9). The leaves possess antibacterial properties and are beneficial in the treatment of purulent paradontosis in the form of a collutory made of the juice or extract. A poultice of the leaves and a wash with the decoction are used in treating wounds, burns, impetigo, furunculosis, eczema, and lymphengitis. The leaves typically applied to the chest cure cough and asthma and if applied to the breast arrest lactation. Friction of the spinal column with the leaves is recommended for treating colds. The roots (8 to 12g) are used in treating rheumatism (10). The essential oil of *P. betle* showed hypertensive, cardiac and respiratory depressant effects (11). Hydroxychavicol (12) showed antidiabetic effect, Allylpyrocatechol showed gastric ulcer-healing action, chavibetol showed Anti-inflammatory effect, piperbetol showed photo protective/

2-D QSAR STUDIES ON TIBO DERIVATIVES: MODELING OF ANTI HIV ACTIVITY

LOKENDRA K. OJHA, AJAY M. CHATURVEDI
AND ARPAN BHARDWAJ

The viral reverse transcriptase (RT) was identified early as an interesting target, with the use of zidovudine (AZT) approved for the treatment of HIV-1 infections in 1987. In spite of more than 20 years of developments, RT remains an important target in antiretroviral therapy, since 12 out of 25 individual agents licensed for the treatment of HIV-1 infection target its polymerization active site. Currently, approved RT inhibitors are divided into two classes: eight nucleoside and nucleotide RT inhibitors (NRTIs), and four non-nucleoside RT inhibitors (NNRTIs). The virus-encoded reverse transcriptase (RT) plays an important role in the life cycle of the human immunodeficiency virus type 1 (HIV-1), the causative agent of AIDS. RT is an attractive target for the development of anti-HIV drugs for the treatment of AIDS. Several compounds targeted against HIV-1 RT have been shown to be active in clinical trials. In this context, the non-nucleoside reverse transcriptase inhibitors (NNRTIs) gained the greatest importance because of their specificity and their low cytotoxicity. NNRTIs now comprise a very large number of chemically diverse compounds including the 4,5,6,7-Tetrahydro-5-methylimidazo[4,5,1-jk][1,4]benzodiazepin-2(1H)-ones (TIBO) derivatives. Non-nucleoside HIV-1 reverse transcriptase inhibitors (NNRTIs) are an important group of structurally diverse compounds which can act as highly effective inhibitors of the enzymatic activity of HIV-1 reverse transcriptase in vitro and of HIV-1 viral replication in cell culture and infected people. To fulfill the criteria of an efficient NNRTI, a compound should bind specifically to the allosteric binding

AN INNOVATIVE TECHNIQUE FOR CONTAMINATED WASTEWATER REMEDiation BY ADVANCED OXIDATION PROCESSES

PRAKASH MORE AND BRIJESH PARE

The presence of dyes in wastewater has become a major issue all over the world. These dyes constitute largest group of organic compounds. These dyes constitute largest group of organic compounds. Environment pollution by organic dyes also sets several ecological problems, which are increased by the fact that most of them are difficult to degrade using standard biological and physical methods. For the removal of such recalcitrant pollutants, some traditional or physical techniques such as adsorption on activated charcoal, ultra-filtration, reverse osmosis, coagulation etc. are used efficiently. Nevertheless they are non-destructive. The conventional processes are insufficient to purify the wastewaters. They transferred the compounds from aqueous to another phase, thus causing secondary pollution problem. Therefore, in recent years, special attention has been focused on the studies concerning the use of advanced oxidation processes (AOPs) that base on the production of highly reactive Oxygen species including hydroxyl radicals (HO \cdot). AOPs can be an alternative for the treatment of wastewater or effluent containing hardly biodegradable organic compounds because they may lead to complete degradation of pollutants to CO $_2$ and H $_2$ O. The key advantage of this method is that can be carried out under ambient condition and lead to complete degradation of organic compounds. Among the advanced oxidation processes, heterogeneous photocatalysis appears as an emerging technology leading to the total mineralization of most of the organic pollutants. It is cost effective and capable of degrading any complex organic chemicals when

**PRELIMINARY PHYTOCHEMICAL
SCREENING OF VARIOUS SOLVENT
EXTRACTS OF FLOWER OF
SPHAERANTHUS INDICUS L. (FAM.
ASTERACEAE)**

**PRIYANKA KHARE, B.K. MEHTA, DARSHANA MEHTA,
B.S. GUPTA AND ARPAN BHARDWAJ**

S. indicus is also known as *Gorakhmundi* or *Mundi* in Hindi, *Kottakaranthai* in Tamil, or *East Indian globe thistle* in English and among other names. It is an herb found mostly in southern India. It is a bitter stomachic, stimulant, alternative, pectoral and demulcent and externally emollient.^{7,8} Unlike many other plants, the flowers of *S. indicus* appear to be commonly used in medicines.

Figure
Sphaeranthus indicus



It is a multi-branched herb with round purple flowers, strongly-scented annual with winged stem and the wings toothed.

MICROWAVE ASSISTED SYNTHESIS OF SOME CHALCONES

RASHMI SHARMA AND AJAY M. CHATURVEDI

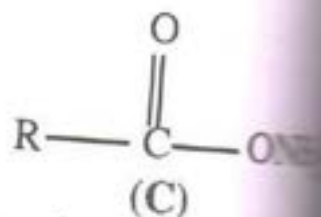
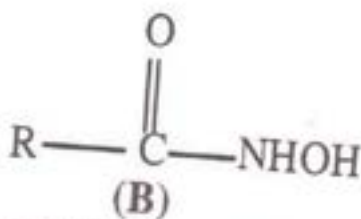
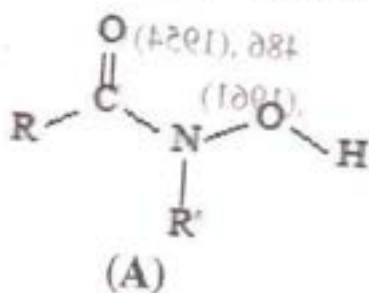
Over the years various innovative methods have been devised to speed up the chemical reactions. In these environmentally conscious days the development of technology is directed towards ecofriendly methods. The usage of microwave energy to accelerate the organic reactions is of increasing interest and offers several advantages over conventional heating techniques. Synthesis of the molecules which normally requires a long time can be achieved conveniently and rapidly in microwave oven. Solvent free condition is especially suitable for microwave activation. Thus the use of microwave energy for the synthesis of organic compounds forms a part of green chemistry.

Chalcones having an α , β unsaturated carbonyl groups are one of the important biocides and versatile synthones for various chemical transformation. Most of the Chalcones are highly biologically active with a number of pharmacological and medicinal applications. Chalcones have been used as anti AIDS agents, cytotoxic agents, antimalarials, anti-inflammatory and anti tumor agents. Keeping in the view of advantages of microwave heating, in the present investigation we have carried out the synthesis of some Chalcones by Claisen-Schmidt condensation. This reaction is generally carried out in presence of base like NaOH or KOH which are harmful, toxic and polluting. Therefore in the present investigation we have used anhydrous K_2CO_3 as the condensing agent which is cheap, non-toxic and easy to use. Further more the reaction can be easily carried out under solvent free condition under microwave irradiation so as to minimize the pollution.

NUCLEOPHILIC HYDROLYSIS OF P-NITROPHENYL ALKANOATES IN CATIONIC MICELLAR MEDIA

REKHA NAGWANSHI, ABHILASHA UPADHYAY
JEEVAN SOLANKI, MANMOHAN L. SATNAMI
AND SHUBHA JAIN

The chemistry of hydroxamic acids began in 1869 when H. Lossen working in W. Lossen's laboratory, isolated Oxalohydroxamic acid from the reaction products of ethyloxalate and hydroxylamine. A hydroxamic acid is a class of organic compounds organic bearing the functional group $(RC(O)N(OH)R')$, with R and R' as organic residues and CO as a carbonyl group (A). They are amines $(RC(O)NHR')$ wherein the NH center has been replaced by an OH. Hydroxamic acids can exist in two forms, i.e. the N-acyl derivative (B) or the O-acyl derivative (C)



The mechanism below begins with an O-acylated hydroxamic acid derivative that is treated with base to form an isocyanate intermediate. The isocyanate intermediate generates an amine and CO_2 gas in the presence of H_2O . The hydroxamic acid derivative is first converted to its conjugate base via abstraction of a hydrogen by a base. Spontaneous rearrangement is observed off a carboxylate anion to produce the isocyanate intermediate. The isocyanate in the presence H_2O hydrolyzes and then decarboxylates via abstraction of a hydrogen by a base generates an amine and CO_2 gas.

ECOLOGICAL SURVEY TECHNIQUES FOR PROTECTED BIRD FAUNA DURING THE PLANNING OF NATIONAL ROAD SCHEMES IN UJJAIN

NEELA ISHAQUE, SAROJ V. RATNAKAR
AND PRIYANKA VARMA

It is important to recognize that the vast majority of the techniques available to survey plants and animals are seasonally constrained and hence sufficient time needs to be put aside to collect baseline data. Under certain circumstances access to sites or features that may be of conservation importance or that could support protected species will not be available. Survey effort will vary significantly depending on the target species or group and the complexities of the habitats concerned. Birds are a diverse group, it is estimated that there are approximately 71,576 species worldwide and, consequently, these animals exhibit a tremendous degree of diversity and variation. Ujjain supports large variety of aquatic and migratory birds. Due to its location and relatively warm, wet climate during the winter months, and present many water bodies Ujjain attracts large numbers of waterfowl and waders.

Wintering Bird Surveys

Although wintering bird surveys may be required on sites supporting a variety of habitat-types, they are generally more commonly associated with wetland habitats. Winter bird surveys of terrestrial habitats can adopt a similar methodology, since they usually aim to identify the presence or absence of target species and an estimation of numbers of birds. For most wetland habitats, an approach based upon the British Trust for Ornithology's (BTO's)

SINGLE CRYSTAL X-RAY DIFFRACTION STUDY OF A MIXED LIGAND COPPER(II) COMPLEX OF 4-ACYLPYRAZOLONE AND 2,2'-BIPYRIDYL

SANJAY PARIHAR AND R. N. JADEJA

The coordination chemistry and reactivity of transition metal complexes containing 4-acylpyrazolone ligands have attracted considerable research interests. This versatile class of ligands reacts with simple, commercially available metal precursors to give metal complexes which provide opportunities for investigations of catalytic as well as biological applications. Due to the presence of two oxygen donor atoms and facile keto-enol tautomerism, they easily coordinate with metal ions after deprotonation of the enolic hydrogen and provide stable metal complexes with six-member chelate rings.

The structural flexibility of acylpyrazolonate ligands often results in a better adaptability to accommodate M-O bond length elongation or shortening. Dependent on the nature of the metal and the coordination behaviour of the ligand one can develop synthetic strategies to influence the one, two or three-dimensional arrangement in the crystal in a more directed way. These molecules can be easily functionalised in the acyl fragment and several examples can be found in the literature, in which substituent range from electron withdrawing groups to electron-donating ones.

In this report a mixed ligand copper(II) complex was synthesized using 4-acylpyrazolone and 2,2'-bipyridyl ligands. Single crystal XRD study of the was carried to determine its geometry.

STUDIES ON PHOTOCATALYTIC DEGRADATION OF DIRECT BLUE USING NANOSCALE ZnO IN THE PRESENCE OF VISIBLE AND SOLAR LIGHT RADIATIONS

SUDESH BHASKAR GHODERAU, SHIVPRIYA PARE
BRIJESH PARE AND VIJENDRA SINGH

Chemical & textile industries are sources of colour dye effluents and these are toxic that induce a lot of damage to the environment. Various methods such as precipitation, air stripping, flocculation, adsorption, reverse osmosis, ultra filtration etc. have been used for removal of them.

Nanostructured semiconductors are a potential candidate for the mineralization of toxic organic compounds, hazardous inorganic constituent, and bacteria disinfection owing to its strong oxidizing ability, i.e., hydroxyl radical. Numerous metal oxides such as zinc oxide (ZnO), titanium dioxide (TiO₂), strontium titanate (SrTiO₃), tungsten oxide (WO₃), silver nanoparticle, and hematite (α -Fe₂O₃) are turned to be potential photocatalysts. ZnO has appeared to be a prominent catalyst as far as water detoxification is concerned; on accounting that, it produces H₂O₂ more efficiently and shows high reaction and mineralization rates. In addition, it was reported that ZnO showed high surface reactivity due to its higher number of active sites. ZnO has been proven as a superior photocatalyst compared to commercial TiO₂ due to its higher initial rates of activities and absorption efficacy of solar radiations. As a result, ZnO has been widely used in the treatment of wastewater owing to its excellent chemical and physical properties. Semiconductor generates electron-hole pair on excitation which may be used either for reduction or oxidation of the dye (Eq. 1, 2 & 3).

PREPARATION, SPECTRAL STUDIES AND ANTIMICROBIAL ACTIVITY OF METAL COMPLEXES OF ANTIMONY AND BISMUTH WITH SUBSTITUTED SEMICARBAZONES AND THIOSEMICARBAZONES

TRIPTI KAMALPURIA

Metal complexes of semicarbazone and thiosemicarbazone ligand have been investigated for their biological application and their interesting structure. The number of nitrogen and oxygen/sulfur chelating agent used to prepare new coordination and organometallic compounds have increased rapidly in current century. Semicarbazone and thiosemicarbazone have received considerable attention due to their variable bonding modes and biological implications. Antimony and bismuth complexes have been used in medicine more than last two centuries. These complexes have significant fungicidal, bacterial and biological activities.

Synthesis of Ligands

Synthesis of Semicarbazone

0.1 mol. (11.15 g.) of semicarbazide hydrochloride and 0.1 mol. (8.20 g.) of crystalline sodium acetate were dissolved in required quantity of distilled water by warming and combine both solution in a beaker, then add 0.1 mol. (10.14 ml.) of benzaldehyde and shake well on cooling yellow shiny solid separates out. Filtered and washed with cold water. It was recrystallised from ethanol.

MOLECULAR MODELING AND DOCKING STUDIES OF TYROSINE PHOSPHATE 1B, A NOVEL THERAPEUTIC DRUG TARGET FOR OBESITY – IN *SILICO* ANALYSIS

VANSHRI SHARMA AND SHOBHA SHOUICHE

Target identification is sole aim of bioinformatics. Computation plays a key role in this method. Bioinformatics deals with finding gene which is regulated in a diseased condition and to find proteins which are expressed by that gene. These proteins may be enzymes or affecting some signaling pathway. The prediction of binding constants for ligands to target receptors is highly desirable in the drug discovery process.

Tyrosine Phosphate 1 B

Protein tyrosine phosphate 1-b is implicated in the regulation of insulin receptor. Dephosphorylation of insulin receptor results in decreased insulin signaling and thus decreased glucose uptake. Before proceeding further we need to have some basis information Leptin is an adipocyte derived hormone (16KDa).

Protein structure prediction

Protein structure prediction is one of the most important goals, pursued by bioinformatics and theoretical chemistry. Its aim is the prediction of the three-dimensional structure of proteins from their amino acid sequences, sometimes including additional relevant information such as the structures of related proteins.

Drug design

Drug design is the approach of finding drugs by design, based on their biological targets. Typically a drug target is a key molecule involved in a particular metabolic or signaling pathway that is specific

SYNTHESIS AND CHARACTERIZATION OF LOW COST TIN OXIDE NANOPARTICLES BY SOL-GEL METHOD

VISHWAJEET SINGH YADAV, RENU HADA, YASHWANT KUMAR MISHRA AND AJAY M. CHATURVEDI

Tin oxide possesses high degree of transparency in the visible spectrum, strong physical and chemical interaction with adsorbed species, low operating temperature and strong thermal stability in air (up to 500°C), hence it is an important material. Tin oxide is an n-type semiconductor with a band gap of 3.6-3.8 eV. Tin oxide has been used as gas sensing material for gas mixture such as CO. Additionally, tin oxide is also widely used in optoelectronic devices, and in lithium batteries. Tin oxide also shows significant role in the field of catalysis than other metal oxides.

However, tin oxide supported catalysts have been reported to be active for oxidative dehydrogenation of propane, CO oxidation, esterification reaction, reduction of NO/NO₂ to N₂ and hydrogenation reaction of nitrate. Oxidation of organic compounds is generally catalyzed by tin oxide. SnO₂ is supposed to be a good adsorbent because of its high surface area. Various surfactants such as CTAB (cetyltrimethylammonium bromide), dodecylamine, tetradecylamine and sodium dioctylsulfosuccinate and AOT can be utilized to produce tin oxide with high surface area. However, removal of the surfactant from tin oxide sample is still a problem and surfactant removal techniques often affect the properties of tin oxide sample.

Experimental

Materials

The chemicals used in this study were tin (IV) chloride tetrahydrate (SnCl₄·5H₂O, Merck LTD, assay 98.99%), Liquid N₂

C₁₆TAB CATALYZED OXIDATIVE DEGRADATION OF AZURE B BY ACIDIC N-CHLORO-P-TOLUENSULFONAMIDE

Y.K. MISHRA, BRIJESH PARE
AND LAVEENA CHOUHAN

The residual dyes from different sources (e.g., textile industries, paper and pulp industries, dye and dye intermediates industries, pharmaceutical industries, tannery, and Kraft bleaching industries, etc.) are considered a wide variety of organic pollutants introduced into the natural water resources or wastewater treatment systems.

One of the main sources with severe pollution problems worldwide is the textile industry and its dye-containing wastewaters. 10-25% of textile dyes are lost during the dyeing process, and 2-20% are directly discharged as aqueous effluents in different environmental components. In particular, the discharge of dye-containing effluents into the water environment is undesirable, not only because of their colour, but also because many of dyes released and their breakdown products are toxic, carcinogenic or mutagenic to life forms mainly because of carcinogens, such as benzidine, naphthalene and other aromatic compounds. Without adequate treatment these dyes can remain in the environment for a long period of time. Thus to treat this coloured water containing dyes is a necessary aspect for human welfare, and stainable development. Azure b is phenothiazine type water soluble dye and used for colouring paper, tannin mordant cotton, silk and leather. Therefore, the oxidation of azure b (AB⁺) by chloramine-T has been carried out in order to optimize the reaction conditions to develop a more efficient colour removing chemical oxidation method. N-chloro-p-toluenesulfonamide (p-Me-C₆H₄-SO₂NCINa.1.5H₂O) abbreviated, as CAT is the widely studied oxidant. The oxidative depletion of dye was found to be catalyzed by

PESTICIDE SCENARIO OF INDIA WITH PARTICULAR REFERENCE TO M.P.: A REVIEW

**H.S. DWIVEDI, ARSHID AHMAD KHANDAY
AND P. DWIVEDI**

India is the second most populous country in the world after china. Agriculture supports 65% of the population of India. In order to gain self sufficiency in food grains and other agricultural commodities, Chemical fertilizers and Pesticides were introduced on a large scale in combination with genetically advanced High yielding crop varieties. Initially the produce was increasing towards the potential productivity of the plants but after a few decades of regular use of these chemicals, the produce came down or showed decreased response to the amendments. Also it was found that the chemicals persisted in soil and affected directly or indirectly the life of both the plants and animals including Humans.

Origin of Pesticides

People tried different methods to keep their produce safe for future use. But even after their best efforts, they lost part of the produce to the pest population either in the fields or during its storage. In 1600 people somehow accidently in England found that wheat seeds soaked in brine were resistant to bunt and later in 1700 Copper sulphate was substituted for sodium chloride. In 1885 with the discovery of Bordeaux mixture (combination of copper sulphate and hydrated lime), Millardet revolutionalized the chemical control methodology for pests. Then in 1913, organic mercury compounds were introduced as seed treatments followed by Thiram (First dithiocarbamate pesticide) in 1934 and Carboxin (A systemic fungicide) in 1965. In the earlier period of organic synthesized

HPLC: AN IMPORTANT ANALYTICAL TOOL IN THE FIELD OF DRUG DEVELOPMENT AND ANALYSIS

KALPANA VIRENDRA SINGH

Mikhail S. Tswett coined the term Chromatography in the early 1900s. His pioneering studies focused on separation of compounds [leaf pigments], extracted from plants by using a solvent, in a column packed with particles. Tswett prepared an open glass column with powdered chalk [calcium carbonate] and alumina and poured his sample [solvent extract of homogenized plant leaves] into the column, allowing it to pass into the particle bed followed by pure solvent. When sample passed down through the column by gravity, he observed different coloured bands separating because of the different moving speeds of the components. He created an analytical separation of these compounds. The compounds that were more strongly attracted to the particles slowed down, while other compounds more strongly attracted to the solvent moved faster. The moving solvent was called as the mobile phase where as the particles in the column were named as stationary phase. The preferential distribution or partitioning of different compounds between mobile and stationary phase leads to separation and analysis of compounds.

Today, liquid chromatography, in its various forms, has become one of the most powerful tools in analytical chemistry.

High performance liquid chromatography is just a highly improved form of column chromatography. Column chromatography involves dripping of solvent through a column under gravity, where as in HPLC solvent is forced through the stationary phase under high pressures of up to 400 atmospheres. That makes it much faster also. HPLC allows the use of much smaller particle size for the column packing material which leads to a much greater surface area for

REVIEW ON NATURAL PRODUCT

PRIYANKA KHARE, VAIBHAV SHARMA, SHRUTI SHARMA, NAMRATA VYAS AND ARPAN BHARDWAJ

Natural product is a chemical compound produced by a living organism found in nature. Natural product has also been extended for commercial purposes refer to cosmetics, dietary supplements, and foods produced from natural sources.^{1,18} Natural products sometimes have pharmacological or biological activities that are used in treating diseases as well as natural products are the active components of many traditional medicines. Synthetic analogs of natural products with improved potency and safety can be prepared and they are often used as starting points for drug discovery.^{3,7,16,17} Anything that is produced by a living organism called natural product e.g., plant or animal, part of an organism such as a leaf of a plant or an organ of animals and minerals etc.

The organic compounds formed by living systems are divided in three categories; Amino acids, carbohydrates, and nucleic acids which are essential to all living organisms, are known as primary metabolites. These are organic substances found in all cells and are essential to the survival of those cells. Cellulose, lignin, and proteins form the structure of cells, called polymeric organic materials whereas unique organic compounds are known as secondary metabolites. Secondary metabolites are generally not essential for the development, growth or reproduction of an organism and are produced as a result of the organism adapting to its surrounding environment. Secondary metabolites also known as natural products and their biosynthesis derived from the intermediates. Primary metabolites exert their actions on the organism that produces them and secondary metabolites mainly exert their activity on other organisms.^{6,9,11,15}

DEGRADATION OF HAZARDOUS PESTICIDES USING AOPs

SATISH PIPLODE AND BRIJESH PARE

Pesticides represent one of the greatest environmental threats because as the world population increased, the need to enhance agricultural productivity also increased.

The treatment methods currently employed for pesticide degradation.

Advanced oxidation processes (AOPs) have already been used for the treatment of wastewater containing recalcitrant organic compounds.

The AOPs work in either of these ways:

- oxidation with O_2 in temperature ranges intermediate to ambient conditions; and
- the use of high energy oxidants such as ozone and/or photons that are able to generate highly reactive intermediates – $\cdot OH$ radicals.

These are various ways by which $\cdot OH$ radicals are generated. These include both non-photochemical and photochemical methods. We present here a systematic review on pesticide degradation of pesticides by AOPs.

Review

Photocatalytic treatment of water-soluble pesticides using Fenton and TiO_2 using solar energy has reported by Malvar J., Cáceres J., Fernández-Alba A. R., Agüera A., Rodríguez 2002. They studied four water-soluble pesticides (imidacloprid, formetanate and methomyl) at pilot scale heterogeneous photocatalysis with titanium dioxide and homogeneous photocatalysis by photo-Fenton using natural-solar UV light. It has been demonstrated that photo-Fenton was more efficient than

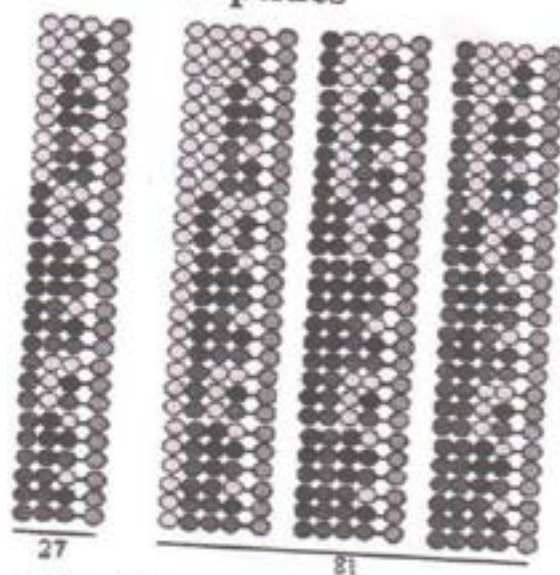
COMBINATORIAL CHEMISTRY

SHRUTI SHARMA, NAMRATA VYAS, VAIBHAV SHARMA, PRIYANKA KHARE AND ARPAN BHARDWAJ

Synthesis of molecules in a combinatorial fashion can quickly lead to large numbers of molecules. For example, a molecule with three points of diversity (R_1 , R_2 , and R_3) can generate $N_{R1} \times N_{R2} \times N_{R3}$ possible structures, where N_{R1} , N_{R2} and N_{R3} are the numbers of different substituent's utilized.

The basic principle of combinatorial chemistry is to prepare libraries of very large number of compounds then identify the useful components of the libraries. In its modern form, combinatorial chemistry has probably had its biggest impact in the pharmaceutical industry. Researchers attempting to optimize the activity profile of a compound create a 'library' of many different but related compounds. Advances in robotics have led to an industrial approach to combinatorial synthesis, enabling companies to routinely produce over 100,000 new and unique compounds per year.¹

Combinatorial Synthesis – Peptides



Peptides forming in cycles 3 and 4

BiOCl AS PHOTOCATALYST IN PHOTOCATALYTIC DEGRADATION OF ORGANIC POLLUTANTS: A REVIEW

BRIJESH PARE AND VAISHALI JOSHI

Due to its low cost, high efficiency and simplicity, photocatalytic degradation of organic compounds in aquatic environment by semiconductor materials has received extensive attention.

Recently, bismuth oxy chloride BiOCl, is regarded as a promising semiconductor material in decomposing organic compounds for environmental remediation because of their layered structure and indirect optical transition characteristic. There are so many strategies which have been employed to improve the photocatalytic performance of BiOCl such as formation of heterojunction, impurity doping and surface metallisation. In this brief review article, the recent progress of photocatalysis using BiOCl semiconductor has been analysed based on the photocatalytic process.

Photocatalysis

Semiconductors (e.g., TiO_2 , ZnO , Fe_2O_3 , BiOCl , WCl_6 , AgPO_4 , CdS , and ZnS) can act as photocatalysts for light-induced redox processes due to their electronic structure, which is characterized by a filled valence band and an empty conduction band with a suitable gap between them⁽¹²⁾.

Recent Advances in BiOCl as Photocatalyst

In the year 2014, Qizhao Wang, Juan Hui, Yujie Huang, Yaming Ding, Yuxia Cai, Shuqun Yin, Zhimin Li and Bitao Su have studied the preparation of BiOCl photocatalyst and its performance of photodegradation on dyes. The photocatalyst BiOCl was prepared by a facile hydrolysis method and the photocatalytic activity of BiOCl was

PHOTOCATALYTIC DEGRADATION OF ORGANIC CONTAMINATION BY ZnO: A REVIEW

VEER SINGH BARDE AND BRIJESH PARE

The use of a heterogeneous photocatalyst is a conventional method for water purification which includes reduction and oxidation reactions from adsorbed wastewater, oxygen molecules and hydroxyl radicals, or other organic molecules. Uses of metal oxides like TiO_2 , ZnO etc. in photocatalysis employ semiconductors in suspension.

Recent review is focused on the most important photocatalysts titanium dioxide and zinc oxide and their photocatalytic activity towards wastewater treatment.

Review

In the present review we have undertaken mainly ZnO. Kabra et al. determined that for an optimum photocatalytic activity, the optimal catalyst loading depends entirely on the type and dimensions of the reactor as well as the type and concentration of the oxidised compound.

Daneshvar et al. and Behnajadey et al. found that photodegradation efficiency of Acid Red 14 and Acid Yellow 23 respectively increases with an increase in ZnO concentration, and then decreases. This decrease was due to the non-availability of active sites on the catalyst surface and the penetration of UV-Visible light into the suspension. Total active surface area available for photocatalysis is directly proportional to the amount of catalyst powder. Daneshvar et al. also studied the affect of pH on photocatalytic degradation rate of colour removal efficiency of acid solution using ZnO (powder) as a photocatalyst.

APPLICATIONS OF CLOUD COMPUTING IN ACADEMIC LIBRARIES

DILIP KUMAR SONI

Today is the age of information technology. The facets of work and personal life are moving towards the concept of availability of everything online. The advancement in information and communication technology has taken a great leap in the last couple of decades. Understanding this trend, the Indian educational institutions and their libraries are trying to setup cloud computing technologies to deal with the internet data storage, scalability and computation for research and libraries.

Cloud computing is an emerging area in the profession of Library and Information Science. Latest technological development has brought a dramatic change in every field, and library science is not exception to it. Information technology impacted positively on library and information system and services they provide for users. The libraries have been automated, networked and now moving towards paper less or virtual libraries. To gather challenges in the profession librarians are also applying different platforms in Library science filed for attaining economy in information handling.

What is Cloud Computing?

Cloud computing means cloud based networking environment. Cloud computing contains set of software and hardware resources which are available on the internet and its services are managed by third-party. These services provide access to advanced software applications and high configured servers. Service provider performs role of consultant. Cloud computing is a technology that uses the web (Internet) and central remote servers to maintain data, software and application. Cloud computing allows users to use applications without installation in their local machine to access their

ORGANIC SYNTHESIS: INNOVATIONS AND NEW TECHNOLOGY

NEELAM KAPIL

Microwave synthesis has become the method of choice for many chemists and biochemists over a number of traditional methods of organic synthesis because it works better. Reactions that took hours or even days, to complete, can now be performed in minutes with better yields. Microwave energy accelerates chemical transformations so variety of chemical applications have increased. In traditional method organic synthesis is carried out at elevated temperature by the use of electric plate heater, oil bath or heating mantle. These methods depend on convection currents and thermal conductivity of the materials therefore transfer of energy to reaction is slow and the temperature of the reaction vessel becomes higher than that of the reaction mixture. In addition a temperature gradient can develop within the sample and product substrat of reagent may decompose in this process due to overheating. In contrast, microwave energy couples with the solvent, reagent or catalyst present in the reaction mixture and produces efficient internal energy when the reaction mixture is exposed to microwave irradiation. Since the reaction vessels are made out of microwave transparent materials, the radiation passes through the walls of the vessel directly into the whole reaction mixture volume.

In typical microwave ovens, the magnetrons (microwave generators) produce a microwave wavelength of 12.25 cm. which corresponds to a frequency of 2.45 GHz.

Mechanism

In microwave method heating is done by two mechanisms: (i) Dipolar polarisation and (ii) Ionic conduction. In this method closed microwave- vessels are used whih can sustain higher pressures, due to

QUALITATIVE AND QUANTITATIVE METHODS TO DETECT HEPATITIS ANTIGEN AND ANTIBODY IN SERUM OF FEMALE HUMAN POPULATION

REKHA KHANNA

Hepatitis B virus is responsible for the most serious form of disease transmitted through sexual contacts, blood and other body fluids (1). Hepatitis B surface Ag is usually detected around 2-6 weeks in advance of clinical and biochemical evidence of hepatitis and persists throughout a clinical course of disease. Acute infection with hepatitis B virus is associated with acute viral hepatitis- an illness that begins with general ill-health, loss of appetite, nausea, vomiting, body aches, mild fever, dark urine, and then progresses to development of jaundice.

Several vaccines have been developed for the prevention of hepatitis B virus infection (2). These rely on the use of one of the viral envelope proteins (hepatitis B surface antigen or HBsAg). The vaccine was originally prepared from plasma (3) obtained from patients who had long-standing hepatitis B virus infection. However, currently, these are more often made using recombinant DNA technology (4), though plasma-derived vaccines continue to be used; the two types of vaccines are equally effective and safe. Vaccine is generally administered in either a two, three, or four dose schedules; and can be received by infants to adults.

Present study is focused on following parameters:

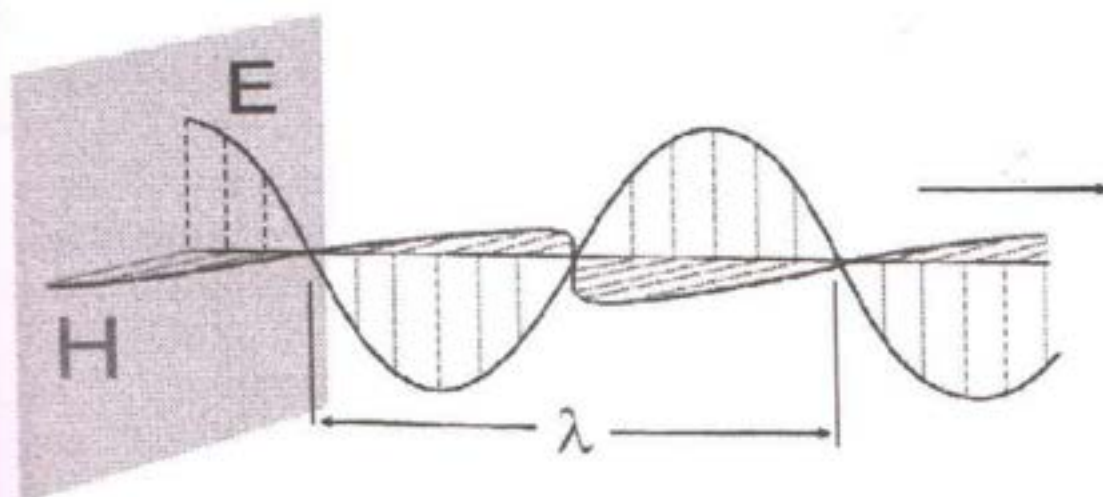
- The effectiveness of vaccination after lapse of time period in different age of females.
- Detection of total immunoglobulins (isotypes) involved in production of antibodies and their detection by reliable diagnostic method.

MICROWAVE SYNTHESIZER: AN INNOVATIVE TOOL FOR SYNTHESIS

SHAKUNTALA PANDEY

Microwave-Accelerated Chemistry Means

- Faster Reactions...
- Higher Yields...
- Improved Purity...



E = electric field

H = magnetic field

λ = wavelength (12.2 cm for 2450 MHz)

Characteristics of Microwave Energy

- Microwaves are electromagnetic radiation between Far IR and Radio Waves
- Microwaves are nominally between 1 mm and 100 cm in length (2450 MHz wave is 12.25 cm)
- Microwave energy is non-ionizing, low photon electromagnetic radiation at the powers used
- Microwave radiation causes molecular (particle) and ionic motion

THE HARD CELL

SHARAD NAGAR

Your body's tiniest building blocks - your cells - hold the secret to long life and great health. They are ultimately responsible for everything, your movement, memories, immune response and even your breathing. If they work, so does everything else. When they fail, it brings on ageing, disease and, eventually, death. Here is the definitive guide to micromanaging your health and putting the inevitable on hold. Following these four steps, will improve your body's performance at the micro level to dodge heart disease and add a decade to your life-

Charge Your Body's Energy Network

Cells are like Laptops: They're only as good as their battery life. The miniature AAs inside your cells, called **mitochondria**, form your body's power grid. They keep everything running, from the neurons that file away memories to the immune cells sent to the front line when you pick up a cold. Treat them right and research says that you'll boost their performance by 56%. **Interval Training** (Cardio exercise at 100% exertion for 60 seconds followed by active recovery for 75 seconds, Repeat eight times, Three session in a week) boosts protein in mitochondria, which makes them more efficient.

De-Stress Your DNA

Stress wears down your cells. "Chronic stress can take years off your life, and this happens at the cellular level", researches found that if you cut the effects of anxiety, the cellular reward amounts to 10 extra years of healthy micro-machines. **Endurance Training** (an hour of running, cycling or swimming) reverses the effects of stress on the body by preserving the chromosomes that house your genetic code, in every cell in your body.

CRYOSURGERY

SHUBHANGI VAIDYA

Cryosurgery is controlled destruction of tissue by freezing. It is today widely used practice in medicine. The terms cryotherapy, cryocautery, cryocongelation and cryogenic surgery, are also used for Cryosurgery but Cryosurgery (literally, cold handiwork) seems most appropriate. Cryosurgery is a cheap, easy, and safe treatment suitable for both hospital and office based practice. Its major advantage is excellent cosmetic results with minimal scarring. The term Cryosurgery comes from the Greek words cryo (icy cold) and surgery (hand work or handiwork).

In comparison, the history of cryosurgery is relatively short and in the nineteenth and twentieth century's closely interwoven with developments in low-temperature physics, engineering and the refinement of the necessary instruments. James Arnott (1797-1883) an English physician used a mixture of salt and crushed ice (two parts finely pounded ice and one part of chloride of sodium) for palliation of tumors with resultant reduction of pain and local hemorrhage.

Cryosurgery has been in use to treat a number of diseases (warts, moles, tags, solar keratoses, Morton's neuroma and small skin cancers) and disorders, especially a variety of benign and malignant skin conditions. Several internal disorders are also treated with Cryosurgery including liver cancer, prostate cancer lung cancer, oral cancer, cervical disorders and bone tumors. Soft tissue condition such as plantar fasciitis (Joggers heel) and fibroma (benign excrescence of connective tissues) can be treated with Cryosurgery.

Cryosurgery works by taking advantage of the destructive force of freezing temperatures on cells. When their temperature sinks beyond a certain level ice crystals begin forming inside the cells and, because of their lower density, eventually tear apart those cells. Further harm to malignant growth will result once the blood vessels supplying the affected tissue begin to freeze. This method of

Economic Dimensions of Agricultural Diversification in India and Madhya Pradesh



Edited by
Tapan Choure

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CONTROLLED RELEASE AGROCHEMICAL FORMULATIONS

METHODS OF PREPARATION AND A REVIEW

KALPANA VIRENDRA SINGH

Conventional agrochemicals are nonspecific and require periodic application of active agents, thus decreasing their ability to produce desirable biological response at the precise time and in precise quantities. Nonspecific nature and active agents produce undesirable side effects to plant and increase the treatment cost enormously. Conventional applications of agrochemicals result in groundwater contamination. Over application and point source contamination increase pollution potential. Replacement of conventional agrochemical formulations by controlled release systems helps to avoid treatment with excess amounts of active substances and offers many economic and ecologic advantages. Controlled release formulations maintain effective local concentration of active ingredients in soil and reduce runoff.

Controlled release formulations have received increasing attention due to growing awareness of undesirable environmental, economical and ecological effects of pesticides. CRF has following advantages

1. Activity prolongation... by supplying sufficient level of pesticide ,to perform function over a long period .Amount utilized is very low
2. Reduction in number of applications, due to long activity duration
3. Cost reduction by eliminating time and cost of repeated use
4. Reduction of environmental pollution



विज्ञान, अध्यात्म
एवं भारतीय साहित्य

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- प्रथम संस्करण 2017

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- विशेष- इस पुस्तक में दिये गये आलेखों का पूर्णरूपेण उत्तरदायित्व उनके लेखकों का ही है। इन आलेखों की विषय-वस्तु से प्रकाशक, प्रधान संपादक, प्रबंध संपादक एवं संपादकगण भी सहमत हो ऐसा जरूरी नहीं है। इन आलेखों से संबंधित किसी भी प्रकार की कार्यवाही (कानूनी अथवा अन्य) हेतु प्रकाशक, प्रधान संपादक, प्रबंध संपादक एवं संपादकगण उत्तरदायी नहीं रहेंगे।

- मुद्रणाक्षर संयोजन :
एपेक्स ग्राफिक्स, इन्दौर

मुद्रक :
नवबी प्रिन्टर्स, इन्दौर

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विज्ञान अपने में समाधि प्रयोगधर्मी सा अन्वेषणों, अ तकनीकी का अध्यात्म अन्तर जो प्रकृति व मानव की अन्त विभिन्न प्रयोग समझता है औ उन्नति के न उद्घाटन कर मनुष्य की सम बोधन चेष्टा अभिव्यक्ति है आनंद प्रदान में शुभ भावों मनुष्य को श्रे मार्ग पर अग्र साहित्य के मा अध्यात्म चिंत सिद्धांतों वैज्ञानिकता लाना, उनके संदर्भों की पु हमारी युवा के सम्मुख कल्याणकारी, शांतिपूर्ण मा ही हमारी पुस्तक का ल पुस्तक में स

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यदि विज्ञान के अविष्कार सरलतम रूपों में आकर हर जेब में बस गये हैं तो अध्यात्म जैसी सुलभ, सुंदर और सुवासित धारणा क्यों घर-घर दस्तक नहीं दे पा रही ? हर दर पर और हर आँगन में यदि एक प्रेम का दीपक जल रहा हो जिसमें वर्तिका आत्मा हो और विज्ञान ईंधन तो शायद समाज में व्याप्त अनाचार, दुराचार और जीवन के कुप्रबंधन से मुक्ति बहुत आसान हो जाए। वस्तुतः आध्यात्मिकता को इतना गूढ़, इतना रहस्यमयी और इतना जटिल बनाकर पेश किया जाता है, उसकी जड़ें ऐसे ग्रंथों, पुराणों और वेदों में बताई जाती हैं, जिनके नाम केवल सामान्य ज्ञान की पुस्तकों के पृष्ठों पर अंकित हैं कि कोई चाहकर भी उसे सहजता से स्वीकार नहीं कर पाता। एक बड़ा श्रेष्ठ एवं शीर्षस्थ आध्यात्मिक गुरु सार्वजनिक जीवन में ऐसा चोला धारण कर लेता है कि वह दर्शन मात्र से ही आम जन से भिन्न दिखाई देता है। वहीं शीर्षस्थ वैज्ञानिक एक आम आदमी जैसा ही दिखाई देता है, बल्कि उससे भी सरल और सहज। इसीलिए आम जनता अध्यात्म को विशिष्ट लोगों और विशेष उम्र के लोगों का विषय मान लेती है। युवा पीढ़ी उससे दूर हो गई है। अध्यात्म के नाम बढ़ते आडम्बर उसे असहज बनाते हैं। जबकि जो भी व्यक्ति शाश्वत सुख की प्राप्ति के लिए परमात्मा की शरण है, वही वास्तव में आध्यात्मिक है। अध्यात्म का लक्ष्य क्या है? यही तो न कि जीवन को गरल मुक्त कर सरल बना दिया जाए, सारे आंतरिक अवरोधों को तोड़कर जीवन को उदात्त-सहज बना दिया जाए। यदि हम यह जान जाए कि आनंद और ईश्वर एक ही है तो विज्ञान और अध्यात्म शायद एक ही लक्ष्य प्राप्ति का साधन बन जाए। क्योंकि नवजीवन का सृजन ईश्वर करता है और यह सृजन असीम आनंद की परिणिति है। वह प्रेम ही तो है जो आनंद की ओर ले जाता है। अध्यात्म की ओर ले जाता है और मुक्ति की ओर ले जाता है। प्रेम वासना नहीं, प्रेम चाहना है। यह चाहत ही तो अध्यात्म है और हर जीवन में चाह किसकी? निश्चित ही आनंद की। चाहत ही कर्म की प्रणेता है तभी तो चरम आनंद ईश्वर का ही स्वरूप है। अध्यात्म का लक्ष्य भी जीवन सत्य की ओर प्रवृत्त करता है और विज्ञान भी सत्यान्वेषण ही है। दोनों की ही प्रक्रिया अनुभूति और प्रयोग पर आधारित है। दोनों का उद्देश्य शक्ति सम्पन्नता है। भौतिक सुख की प्राप्ति के लिए हम बाहर भागते हैं और आध्यात्मिक सुख के लिए भीतर की ओर।

भौतिकता से हम क्षणिक बाहरी आनंद तो आसानी से प्राप्त कर सकते हैं, पर यह स्थायी नहीं होता। अध्यात्म मनुष्य को स्थायी आंतरिक आनंद प्रदान करता है। ईश्वर ने केवल मनुष्य को ही आध्यात्मिक आनंद का सुख प्रदान किया है इसीलिए मानव जन्म को अत्यन्त दुर्लभ कहा है — देवता भी इस रूप

भारतीय चिंतन परम्परा की वैज्ञानिकता से जुड़ें

डॉ. अनिल पाण्डेय

भारतीय चिंतन परम्परा विश्व की प्राचीनतम गौरवशाली परम्परा है। एक ऐसी चिरन्तन परम्परा जिसने सर्वप्रथम विश्व को अपनी ज्ञान रश्मियों से प्रकाशित किया और भारत को विश्वगुरु के रूप में प्रतिष्ठा दी। यह परम्परा अनेकों अवरोधों को पार करते हुए आज भी जीवन्त बनी हुई है क्योंकि इसकी जड़े अध्यात्म, विज्ञान और साहित्य से पोषित हैं। हमारी परम्परा का प्राणतत्व अध्यात्म ही है जिसके स्वरूप सुचिन्तित, अनुभव सिंचित एवं प्रयोग सिद्ध है। किन्तु आज हम पाश्चात्य प्रभाव एवं भौतिक सभ्यता से आक्रान्त स्वयं अपनी ही परम्पराओं से दूर हो गए हैं, अपनी संस्कृति, संस्कार और साहित्य से कट गए हैं और बाहरी चकाचौंध की दुनिया को ही सुख का आधार मान बैठे हैं, जो एक मृगमरीचिका मात्र है, उसमें सुख संतोष और पूर्णता कहाँ? इसीलिए हमारा देश निरंतर दुख, संत्रास, निराशा, हिंसा, अविश्वास, स्वार्थ और अपरिसीमित महत्वाकांक्षाओं से अशांत हो रहा है।

हम यदि अपने को, परिवार को, समाज को, देश को उन्नत और आनंदमय मार्ग पर आगे बढ़ाना चाहते हैं तो हमें देश के युवाओं को भारतीय चिंतन परम्परा से जोड़ना ही होगा। मूल्य आधारित जीवन की राह पर ही हमें अपने इच्छित की प्राप्ति होगी। हमारे यहाँ कहा गया है कि जीवन मूल्यों, कलाओं, संस्कारों और ज्ञान के बिना मानव पशु तुल्य है।

हम अपने बालकों, किशोरों और युवाओं को भारतीय चिंतन से किस प्रकार जोड़ सकते हैं - इस हेतु कुछ बिन्दु रूप सुझाव प्रस्तुत हैं-

आवश्यक है बाल्यकाल से ही मूल्य आधारित शिक्षा प्रदान की जाये। नियमित अध्ययन पठनपाठन के अतिरिक्त हमें नैतिक शिक्षा व सामाजिक शिक्षा की समुचित व्यवस्था करना चाहिये। इसके लिए छोटे-छोटे सोपानों में किसी आदर्श जीवन जीने वाले सफल विभूतियों का चित्रण, वर्णन या फिल्म दिखाई जाना चाहिये। आज हम बड़ों ही नहीं बच्चों में भी नैतिक मूल्यों का हास देख रहे हैं। आपाधापी के इस युग में माता-पिता के पास संस्कार के लिये समय नहीं है। वे अपने बच्चों की स्कूल फीस अदा करने व कोचिंग में शिक्षा दिलाने को ही अपनी जिम्मेदारी की इतिश्री मानते हैं। जबकि वे नहीं जानते कि वे उनमें एक अनुशासनहीन भविष्य के बीज बो रहे हैं, जो फलित होकर उनके लिए ही भस्मासुर सिद्ध होगा। अतः नैतिक शिक्षा व सामाजिक उत्तरदायित्व व कर्तव्यबोध का जागरण अत्यन्त आवश्यक है।

जो पीढ़ी आज 50 या 55 वर्ष की उम्र के दौर से गुजर रही है, उन्हें तो कम से कम अपने परिवारों से संस्कार व जीवन मूल्य की न्यूनाधिक

हमारी भारतभूमि का मानवसमाज जिस प्रकार भाषा, भूषा और अन्यान्य विषयों में विविधता को बनाये हुए भी भारतीय संस्कृति की एकरूपता का पूर्ण उपासक बना हुआ है उसी प्रकार आस्तिक वर्ग भी भिन्न-भिन्न सम्प्रदायों में दीक्षित होते हुए भी मंत्र, तंत्र और यंत्रों में एक समान विश्वास रखता आया है। लौकिक साधनों को प्राप्त कर लेना ही उसका अंतिम लक्ष्य नहीं है अपितु परलोक को सुधारने पर भी उसका पूरा ध्यान है। अतः जो कार्य परिश्रम और प्रयास से सिद्ध हो जाते हैं वे तो लौकिक प्रयत्नों के द्वारा साध लिये जाते हैं किन्तु पारलौकिक परमार्थ की सिद्धि के लिए उपासना का आश्रय आवश्यक है। विशेषता यह है कि यदि उपासना से ही दोनों प्रकार के लौकिक और पारलौकिक कर्म सिद्ध हो जाते हैं तो मनुष्य इधर-उधर क्यों भटके? यही सोचकर पूर्वाचार्यों ने 'एका क्रिया द्वयर्थकरी प्रसिद्धा' इस उक्ति को चरितार्थ करते हुए मंत्र-तंत्र आदि की उपासना का विस्तार किया है। प्रत्येक मनुष्य अपने आपको सब ओर से सुखी और सम्पन्न देखना चाहता है। सुख की प्राप्ति के अनेक साधन हैं, उनमें तंत्र-साधना भी एक है। इस साधना के द्वारा बड़ी से बड़ी और छोटी-से-छोटी जैसी भी समस्या हो उसका समाधान सहज प्राप्त किया जा सकता है। भारतीय जीवन में आस्तिकता पूर्णरूप से घुली-मिली है और इसके फलस्वरूप प्रत्येक भारतीय अपने धर्म और सम्प्रदाय के अनुसार तांत्रिक तत्त्वों से संबंध जोड़कर उससे लाभान्वित होता रहता है।

'तंत्र-शक्ति' में प्रकृति से प्राप्त वस्तुओं के सहयोग से उनमें सोई हुई देवी-शक्ति को जगाकर अपने अनुकूल बनाने और उनके द्वारा अपने इच्छित कार्यों को सफल बनाने की विधि बताई गई है। उचित समय, उचित देश एवं उचित पद्धति से किए गए कार्य ही वस्तुतः सफल होते हैं। मानव जीवन की आवश्यकताओं और आकांक्षाओं की पूर्ति के अनेक साधनों में तंत्र सरल और सुगम साधन है। यह भ्रम सर्वथा निर्मूल है कि तंत्र केवल भूल-भुलैया अथवा मन बहलाने का नाम है। तंत्र का विशाल प्राचीन साहित्य इसकी वैज्ञानिक सत्यता का जीता-जागता प्रमाण है। आधुनिक विज्ञान और तंत्र में बहुत समानता होते हुए भी तंत्र में स्थायित्व है, सत्य है और कल्याण है। तंत्र विधान का शास्त्रीय परिचय और विधि का सर्वांगीण ज्ञान साधना को सफल बनाकर सिद्धि तक पहुँचाता है। लोक कल्याण और आत्म कल्याण की कामना से किए गए तांत्रिक कर्म इस लोक और परलोक दोनों में लाभदायी होते हैं।

नित्यकर्म, संक्षिप्त हवन विधि, शास्त्रीय गणपति और गायत्री तंत्र के अभिनव प्रयोग आपको कष्टों से बचाने में सहायक होंगे। हमारी मान्यता है कि ये यंत्र आज के व्यस्त जीवन में अनेक समस्याओं से घिरे हुए मानव जीवन के

‘कामायनी’ में आध्यात्मिक एवं वैज्ञानिक चेतना

डॉ. शशि जोशी एवं डॉ. निखिल जोशी

‘कामायनी’ छायावादी काव्यधारा का कालजयी महाकाव्य है। इसमें कवि जयशंकर प्रसाद ने सृष्टि के रहस्य मानव जीवन के विकास एवं जीवन के शाश्वत सत्यों को वैज्ञानिक दृष्टि से उद्घाटित किया है। स्वयं जयशंकर प्रसाद ने ‘कामायनी’ की भूमिका में कहा है – “यदि श्रद्धा, मनु और मनन के सहयोग से मानवता का विकास रूपक है, तो भी बड़ा ही भावमय और श्लाघ्य है। वह मनुष्यता का मनोवैज्ञानिक इतिहास बनने में समर्थ हो सकता है। आज हम सत्य का अर्थ घटना कर लेते हैं। तब भी उसके तिथि-क्रम मात्र से संतुष्ट न होकर, मनोवैज्ञानिक अन्वेषण के द्वारा इतिहास की घटना में कुछ देखना चाहते हैं। उसके मूल में क्या रहस्य है? आत्मा की अनुभूति! हाँ, उसी भाव के रूप ग्रहण की चेष्टा सत्य या घटना बन कर प्रत्यक्ष होती है फिर वे सत्य घटनाएँ स्थूल और क्षणिक होकर मिथ्या और अभाव में परिणित हो जाती हैं किन्तु सूक्ष्म अनुभूति का भाव, चिरंतन सत्य के रूप में प्रतिष्ठित रहता है, जिसके द्वारा युग-युग के पुरुषों की और पुरुषार्थों की अभिव्यक्ति होती रहती है।” अतः ‘कामायनी’ किसी एक युग की रचना नहीं, युगातीत है।

‘कामायनी’ में 16 सर्ग हैं। कवि ने मानव मन की वृत्तियों को ही चरित्र बना दिया है क्योंकि संसार में उनका ही विलास है। उन्होंने कथा भले ही शतपथ ब्राह्मण अथवा छांदोग्य उपनिषद् से ली है किन्तु वह कथा मनु, श्रद्धा, इड़ा की नहीं मनुष्यमात्र की है। जिन भावों से सृष्टि का निर्माण होता है वे भी उसमें पात्र हैं और लक्ष्य आनंद की प्राप्ति है।

इस जगत् में दो सत्ताएँ हैं। एक आन्तरिक जगत् जो अव्यक्त है और दूसरा बाहरी जगत् जो व्यक्त है, जिसे जाना जा सकता है, प्रमाणों के आधार पर परखा भी जा सकता है। आन्तरिक जगत् को अनुभव किया जा सकता है किन्तु बाहरी जगत् का आधार आन्तरिक जगत् ही है। सृष्टि संकल्प से होती है, बोध होते ही क्रियान्वित होती है। आन्तरिक जगत् में प्रवेश कर ‘मैं’ का अनुसंधान करना, स्वयं को जानना अध्यात्म है और जगत् में अज्ञात रहस्य बिखरे पड़े हैं उनका अनुसंधान विज्ञान है। ‘कामायनी’ में दोनों सत्ताओं पर सतत् चिंतन है क्योंकि मानवता के विकास में दोनों ही सहायक हैं। दोनों का उद्देश्य एक ही है मानवता का कल्याण हो, वह सुन्दर व सत्य से युक्त हो।

‘कामायनी’ का प्रारंभ ही अद्वैत की अभिव्यक्ति से होता है। सर्वत्र एक ही तत्त्व व्याप्त है। दिखने में परिवर्तित है। एक जड़ है, दूसरा चेतन है किन्तु जड़ व चेतन में एक ही तत्त्व प्रधान है। ‘चिन्ता सर्ग’ की पंक्तियाँ द्रष्टव्य हैं –

विज्ञान एवं अध्यात्म दोनों परस्पर पूरक हैं। विज्ञान के लिए अध्यात्म की एवं अध्यात्म के लिए विज्ञान का आधार आवश्यक है, क्योंकि यदि विज्ञान अध्यात्म अर्थात् आदर्शों, मूल्यों एवं नैतिकता की उपेक्षा करता है तो केवल विज्ञान के ऊपर आधारित सम्यता एवं विकास अंत में संपूर्ण विश्व को एवं मानव जाति को विनाश के गर्त में ढकेल देता है (इसी प्रकार यदि अध्यात्म विज्ञान की उपेक्षा करके आध्यात्मिक मूल्यों आदर्शों की व्यवहारिक जामा नहीं पहनाता है, उनके विकास के लिए उनकी सत्ता के लिए सशक्त आधार प्रदान नहीं करता है तो कोरे अध्यात्म का कोई मूल्य नहीं है)।

विज्ञान एवं अध्यात्म अन्योन्याश्रित हैं। एक के बिना दूसरे की गति नहीं। विज्ञान हमारे साधनों को बढ़ाता है एवं अध्यात्म आत्मा तक पहुँचाने का साधन है। अध्यात्म अर्थात् आत्मा को खोकर हमारे साधनों की मात्रा कितनी ही बढ़ी चढ़ी क्यों न हो परंतु इससे अर्थात् भौतिक प्रगति से मनुष्य भोगी व्यसनी अहंकारी एवं स्वार्थी ही बनेगा। महत्वाकांक्षाओं से मनुष्य नैतिक नहीं हो पाता वरन उचित अनुचित अच्छे बुरे सारे मार्ग अपनाकर वह अपनी असीम इच्छाओं एवं आवश्यकताओं को संतुष्ट करना चाहता है। अतः मनुष्य को यही अध्यात्म की आवश्यकता है क्योंकि अध्यात्म मनुष्य की निरंकुश आशाओं आकांक्षाओं को नियंत्रित एवं मर्यादित करके उचित दिशा की ओर ले जाता है। वैज्ञानिक दृष्टि का अर्थ यह है कि मनुष्य मान्यताओं, पूर्वाग्रहों एवं आस्थाओं की पराधीनता से ऊपर उठकर विवेक एवं बुद्धि के माध्यम से यथार्थ एवं सत्य को समझ सके। तथ्यों एवं प्रमाणों की कसौटी पर जो खरा उतरे उसी को अपना वस्तुतः सत्य की खोज है। इसे हटा देने पर अध्यात्म निष्प्राण ही नहीं भ्रमोत्पादक और भय संवर्धक बन जाता है। सत्य के प्रति हमारी निष्ठा, श्रद्धा एवं विश्वास विवेकपूर्ण, तर्कयुक्त एवं वैज्ञानिक होना चाहिए। बुद्धि एवं विवेक रहित परम्परावादी आग्रह एवं मान्यताएँ अध्यात्म के मार्ग में बाधक हैं।

यही मौलिक कारण है कि सभी विद्वान, विचारक एवं दार्शनिक दोनों की उन्नति पर बल देते हैं। वैज्ञानिक विकास के कारण ही आज मानव सर्व सुविधाओं को सरलता पूर्वक हासिल करता है एवं शेष बचे समय को आत्मिक ईश्वरीय एवं नैतिक आवश्यकताओं की पूर्ति हेतु स्वयं को सक्षम महसूस करता है। विज्ञान मानव मात्र के अपेक्षित उद्देश्यों एवं लक्ष्यों की पूर्ति हेतु अनुकूल परिस्थितियाँ एवं सशक्त आधार प्रदान करता है। वैज्ञानिक प्रगति के कारण ही मनुष्य अपने घर पर बैठकर ही विश्वभर की जीवन के सभी क्षेत्रों की मनोवांछित जानकारी एवं ज्ञान प्राप्त करना है तथा उन्हें अपने कैरियर के निर्माण में तथा

Meditation: a useful tool in the management of Gullian Barre Syndrome

Dr. Kalpana Virendra Singh

Gullian Barre Syndrome is a demyelinating inflammatory disease which affects multiple peripheral nerves. The onset is acute in nature with four sub types: 1. acute inflammatory demyelinating polyradiculoneuropathy (AIDP), 2. acute motor axonal neuropathy (AMAN), 3. acute motor and sensory axonal neuropathy (AMSAN) and 4. Miller-Fisher syndrome. The disease onset is acute or sub acute in nature. The clinical symptoms include flaccid ascending symmetrical limb weakness/paralysis, cranial nerve palsies, absence of deep tendon reflexes, severe pain and paraesthesia. The annual incidence of disease vary up to 4 cases per 100000 of population. It's a auto immune disorder in which the body's immune system attacks peripheral nervous system. As the peripheral nerve's myelin sheaths are degraded, nerves can not transmit signals efficiently and muscles begin to lose their ability to respond to brain's commands, carried through the nerve network. Brain reception of sensory signals from rest of the body also decreases and the result is an inability to feel textures, heat and other sensations. Brain may receive false signals resulting into painful sensations, signals from arms and legs have to travel the longest distance to reach brain they are most vulnerable to get interrupted. However the exact cause of syndrome is an active area of neurological investigation, which needs cooperative efforts from neurological scientists, immunologists and virologists, the syndrome is in limelight because of it's relevance to ZIKA Virus infection and other viral infections. Zika is turning out to be a pandemic and GBS as the after shock is making it more worse. There is no established cure for GBS, there are therapies which lessen the illness and may accelerate recovery and may fight with the complications of the disease. This includes plasmapheresis, high dose immunoglobulin therapy and the use of steroid hormones. Use of steroid hormones may however is not effective in all cases and may cause deleterious effect on the disease. According to pilot studies conducted across the Globe Meditation, Pranayam and Yoga can help GBS patients in improving sleep qualities and pain management.

Meditation is an age old practice for training the mind, historically reserved for austere yogis sitting in lotus posture, kung-fu masters and ochre robed swamis, but it has gone mainstream now. Meditation is one of the most effective ways to train and focus one's attention. It has been proven now with scientific theories and experiments that meditative state has extremely positive psychological, physiological and neurological effects. Stress



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COMPUTATIONAL MOLECULAR MODELING METHODS IN THE DEVELOPMENT OF COVALENT MODIFIER DRUG MOLECULES : SPECIAL REFERENCE TO DENSITY FUNCTIONAL THEORY

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Abstract

Density functional theory (DFT) has been utilized extensively in the past decade in the theoretical investigation of large molecules. Owing to the balanced accuracy and efficiency, DFT finds applications in the complex Chemical, physical as well as Biological molecular systems and offers viable computational protocols. DFT is particularly useful for large molecular systems to which the applications of accurate ab-initio methods may be difficult or sometimes not possible. [1-9]

Editor's Biography



Dr. Ashok G. Matani is presently working as Associate Professor in Mechanical Engineering Department in Government College of Engineering, Amravati- [M.S.] - India. His educational qualifications are Ph.D. (Mechanical Engineering), MBA (Marketing), having total Academic, and Research, Administrative & Industrial experience of more than 28 Years. He had presented a very good number of research / technical papers in various Seminars / Conferences organized in IITs / IIMs / NITs / Central Government Funded Institutions and delivered keynote addresses and worked as session chair in International Conferences / Seminars organized in IIT Roorkee, IIM Bangalore, NIT Trichy, NIT Bhopal, SVNIT Surat, BITS Pillani- Hyderabad Campus, and other educational institutions approved by AICTE / UGC. His areas of Interest are: energy conservation, industrial engineering, productivity, industrial management, operations management, entrepreneurship, water conservation and environment, educational management. Under his guidance Two Ph.D. scholars have been awarded Ph.D. degree & One Ph.D. scholar has submitted Ph.D. Thesis and One Ph.D. scholar research work in progress. He had organized 10 FDPs / MDPs / STTPs sponsored by AICTE/ ISTE under TEQIP. His 4 patents have been accepted for publication on Indian Patent Office Mumbai website. He had delivered an excellent number of expert lectures in various short term training (STTP) / faculty development programs (FDP) in various States of India. His Google Scholar Citations – Citations = 187, H- index = 7, i-10 = 6.

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2	Dr. Ajay Saxena, Giriraj Sharma, K. L. Jat, and M. P. Rishi	Physics	Propagation of electro-kinetic waves in magnetized GaN semiconductor with nano-sized ion colloids	International Conference on emerging interfaces of plasma science and technology	American Institute Of Physics AIP conference proceeding 1670 ;030023	2015	ISBN- 978-0-7354-1317-7	American Institute Of Physics AIP	https://aip.scitation.org/doi/10.1063/1.4926707
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Preface: International Conference on Emerging Interfaces of Plasma Science and Technology

Plasma, the fourth state of matter is unique in the sense that it occupies nearly 90% of the space in the galaxy. Although life is not possible in plasma state, plasma proves to be a boon to livelihood of mankind on earth being continuous source of energy and light from Sun and stars in which plasma exists at high temperature prevalent there. One encounters the natural plasma in stellar interiors and atmospheres, gaseous nebulae, Van-Allen radiation belts and solar wind. By making a glance to our daily life, we come across plasma in the flash of a lightning bolt, the soft glow of the Aurora borealis, fluorescent tube or neon sign and the slight amount of ionization in a rocket exhaust.

The field of plasma science has been extended in many directions and its techniques have intruded upon many areas of both fundamental and practical interest. There is a need of synergy between theoreticians pursuing research in plasma science exploring a wide range of basic plasma phenomena, including the excitation of plasma waves, generation and saturation of plasma instabilities, transport of intense heat fluxes and experimentalists involved in technological aspects of plasma science so that their ideas could be woven together for the benefit of humankind and betterment of society. It is high time that interfaces of plasma science and technology are introspected and utilized properly. School of Studies in Physics is a suitable place for this activity since it flags the leadership of many renowned physicists such as Prof. S.Guha, who coined for the first time the concept of dusty plasma, Prof. S. K. Ghosh who initiated the field of ion implanted semiconductor plasma and has been the seat of knowledge for Padmasree Prof. M.S. Sodha, the father of plasma physics in India and eminent physicist Prof. M. Salmullah during their visits.

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Conference date: 9-10 March 2015
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Volume number: 1670
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Dispersion and absorption of longitudinal electro-kinetic wave in implanted GaN semiconductor plasmas

AIP Conference Proceedings 1670, 030035 (2015); <https://doi.org/10.1063/1.4926719>

Dilip Soni¹, Giriraj Sharma^{2, a)}, Ajay Saxena³, and Akhilesh Jadhav⁴

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²SRJ Government Girls' College, Neemuch (M P), India

³Government College, Garoth, Dist. Mandsaur (M P), India

⁴Government J Yoganandam Chhattisgarh College, Raipur (C G), India

^{a)}Corresponding author: grsharma@gmail.com

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ABSTRACT

Propagation of electro-kinetic waves in magnetized GaN semiconductor with nano-sized ion colloids

AIP Conference Proceedings 1670, 030023 (2015); <https://doi.org/10.1063/1.4926707>

Ajay Saxena¹, Giriraj Sharma^{2, a)}, K. L. Jat³, and M. P. Rishi⁴

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- Leptons

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Based on hydrodynamic model of multi-component plasma, an analytical study on

Origin of Lox satellite in the light rare earths on the basis of plasma theory

AIP Conference Proceedings 1670, 030012 (2015); <https://doi.org/10.1063/1.4926696>

Manjula Jain^{1, a)} and B. D. Shrivastava^{2, b)}

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- Plasma waves

ABSTRACT

The satellite emission of the X-ray spectra of the light rare earths on the basis of plasma theory

Proceedings of Research Papers Presented At The National Research Seminar In
English On "Widening Canvas Of Literature" Held On 03rd And 04th December, 2015

Significance of pronunciations in ELT

R. C. Hemnani

Assistant Professor of English,

Government Madhav Science College Ujjain

(M.P.) 456010

Abstract

Language is the tool for communication and handling of any tool requires a certain skill. To be able to use English for communication one must possess all the communication skills. These are Listening, Speaking, Reading and Writing – LSRW in short. All the four skills are equally important and one must acquire a command over them for the purpose of communication. However modern research is in the field of foreign language "here especially in English" have shown that the teaching of the English must start in its spoken forms.

There are many illiterate people but they use language for communication and the only medium of the language they can use is the 'aural medium' i.e. speech. Moreover written language is only an attempt to represent the sounds used in the spoken language by marks on the paper. Spoken English is produced by the movements of the organs of the speech - the Lungs, the larynx, the soft palate, the tongue, the teeth and the lips. So every normal human being can produce any of the sounds of human speech. Written English consist of 26 letters in the Alphabet but 44 sound units. For the production of sound units we use different organs of the speech.

Unfortunately in an English course students spent most of the time in reading rather than listening to the spoken words. Even when new words are learnt their spellings, collocations, meanings etc. are taken in to account. Their pronunciation is generally ignored. As a result they are not able to speak English correctly. Simultaneously our students speak a variety of English. The students from the regional medium schools have no knowledge of stress and they retain the regional pronunciations. Even in the same regional or English medium schools, the students display a considerable Variety of pronunciation in their spoken

English. Hence the phonological study of the spoken English of the students studying in the different regional and English medium schools becomes essential in order to restrain their phonological divergences and enable them to speak at least – intelligible and accepted Indian English.

The purpose of this paper is to familiarize the student with the basics of the spoken English at under graduate level without dwelling on the technical details. To achieve this goal the model of GIE is recommended to Indian students. After achieving intelligibility in India all efforts must be made to acquire R.P. (received pronunciations) of England in order to achieve international intelligibility.

Introduction

Language when used for communication is a tool and handling of any tool requires a certain skill. To be able to use English for communication one must possess all the communication skill or language skills. These are listening, speaking, reading and writing- 'LSRW' in short.

As all the skills are important one must acquire a command over them to a considerable extent. However modern researchers in the field of foreign language have shown that the teaching of English must start in its spoken form. Spoken language is more important than the written language for the following reasons:

- 1) It came first in the history of every language community, the history of a language reveals that the spoken form of language came centuries before the written form.
- 2) Written language in any attempt to represent the sounds used in the spoken language by marks on the paper.
- 3) There are many peoples who cannot read or write but do use language for communication and the only medium of the language they can use is the 'Oral Medium i.e. Speech.
- 4) People all over the world write 9%, read 16%, Speak 35% and listen 40% of a language in a day.

Though above given reasons establish the primary use of speech in language learning, so listening and speaking came to have a priority over reading and writing. The sequence of skill in order of priority should be:

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Frontiers of Physics and Plasma Science

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Preface to the conference proceedings

We are very pleased to introduce the proceeding of FPPS-2016; the international conference “**Frontiers of Physics and Plasma Science**” that took place on 7 and 8 November, 2016 in the campus of Ujjain Engineering College, Ujjain (India). The goal of the meeting was to provide a broad prospective to the plasma science emphasizing physics with a new plasma technologies. The scientific program of the conference focused on the advancement of the all branches of physics in achieving all applications of the plasma science. The conference spans a wide range of topics, reporting experiments, techniques and ideas that advance the plasma science worldwide.

There were 20 invited lectures and 04 oral presentations covering the different area of the conference. The keynote lecture was delivered by Dr. Rajdeep Singh Rawat (NTU, Singapore) on “Density plasma focus: novel high energy density plasma device”. Prof. Y.C. Saxena (IPR, Gandhinagar, Ahmedabad), Prof. R. P. Sharma (IIT, New Delhi), Prof. Fernando Haas (Brazil), Prof. Davoud Dorrnanian (Tehran, Iran), Dr. Raju Khanal (Tribhuwan University, Nepal), Prof. Avinash Khare (IIT, New Delhi), Dr. Navin Dwivedi (Israel), Prof. V.K. Tripathi (IIT New Delhi), Dr. J. Ghosh (IPR, Gandhinagar, Gujarat), Dr. Devendra Sharma (IPR, Gandhinagar, Gujarat), Prof. R.K. Thareja (IIT Kanpur), Dr. Vipul Arora (RRCAT, Indore), Prof. M. P. Bora (Gauhati University, Guwahati) and many more have delivered their lectures in the field of plasma science and its applications. The program was chaired in a professional and efficient way by the session chairmen who were selected for their international standing in the subject.

The 165 abstracts that were presented in two days (during parallel poster session) formed a heart of the conference and provided ample opportunity for the discussions. The 170 participants, 110 of whom were students had many fruitful discussions and exchange the ideas that contributed to the success of the conference. A panel of experts (Prof. R.P. Sharma, Prof. T. S. Gill, Prof. N.S. Saini, Prof. K. P. Maheshwari, Dr. A.P. Misra, and Dr. V. Ganeshan) was there to judge the presented posters and 6 best posters were awarded prize. Participants from six countries (India, Nepal, Iran, Singapore, Brazil and Israel) made the conference truly international in scope. Of the total number of presented abstracts, 54 of these are included in this



proceedings volume. These papers maintained the high promise suggested by the written abstracts.

Finally, we would like to extend our special thanks to Dr. Umesh Pendharkar, Principal, Ujjain Engineering College, Ujjain for his constant motivation provided during the preparation of the conference. We appreciate the project fellow Shweta Jain (MPCST, Bhopal), Archana Patidar (UGC, New Delhi), Tripti Rimza (SERB-DST, New Delhi) and Karishma Jena (MPCST, Bhopal) for their hard work and enthusiasm for making this conference a grand success. We also gratefully acknowledge the contribution of Prof. B. D. Shrivastava, Vikram University, Ujjain in assembling the conference proceeding. We would like to thank all of the participants attending the conference and also to the committees for their valuable contribution. It is our pleasure to acknowledge the Directorate Technical Education (Bhopal), SERB-DST (New Delhi) and MPCST (Bhopal) for their financial support.

Dr. Prerana Sharma

Department of Physics, Ujjain engineering college, Ujjain, – 456010, India

Editor

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Preparation and characterization of bismuth oxichloride (BiOCl) nanoparticles and nano zerovalent iron (nZVI)

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Preparation and characterization of bismuth oxichloride (BiOCl) nanoparticles and nano zerovalent iron (nZVI)

Bhawna Sarwan^{1,a}, Brijesh Pare¹ and Aman Deep Acharya²

¹ Laboratory of Photocatalysis, Department of Chemistry, Govt. Madhav Science P. G. College, Ujjain 456010, MP, India,

³ Lovely Professional University, Phagwara 144411, Punjab, India

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Abstract. In this work, we have synthesized nano scale zerovalent iron (nZVI) particles by borohydride reduction method and bismuth oxichloride (BiOCl) by a hydrolysis method. X-ray powder diffraction (XRD) was used for the structural and chemical characterization, while scanning/transmission electron microscopy (SEM/TEM) were employed to determine the physical properties of the nanoparticles. The reactivity of synthesized nanoparticles was compared by decolorization of Nile blue (NB) dye under visible irradiation.

1. Introduction

Nano zero-valent iron nano particle (nZVI) having zero valency with primary particle size less than 100 nm is moderately reactive in water and can serve as an excellent electron donor, which makes it a versatile remediation material [1]. Zinc oxide, with its unique physical and chemical properties, such as high chemical stability, high electrochemical coupling coefficient, broad range of radiation absorption and high photostability, is a multifunctional material. The physical properties of as prepared materials were characterized by XRD, SEM, TEM. The efficiency of prepared nanoparticles was examined by the decolorization of Nile blue (NB) under visible light irradiation.

2. Experimental

BiOCl powder was synthesized by a hydrolysis method. In this synthesis reagent Bi₂O₃ (AR, Aldrich) was dissolved in hydrochloric acid (AR, Merck) to get a BiCl₃-HCl aqueous solution. By adjusting the pH value of the solution about 3 with ammonia (AR, Shanghai), the surface of Bi₂O₃ particle converted to BiOCl [2-3]

For synthesis of nZVI, 0.8 M borohydride (NaBH₄) (AR, Merck) aqueous solution was added drop wise to a 0.6 M ferric chloride (FeCl₃ .6H₂O) (AR, Merck) aqueous solution with stirring at ambient temperature, black particles immediately formed. Synthesized nano particles were filtered by vacuum filtration and rinsed three times with ethanol to remove all the water. Then particles were stored in a bottle covered with ethanol and placed in a desiccators till further use.

3. Results and discussions

XRD patterns of the nZVI and BiOCl particles are shown in figure 1. In figure 1a, the strong and sharp diffraction peaks confirmed the highly crystalline nature of BiOCl. XRD patterns of the nZVI figure 1b





**X RAY K ABSORPTION NEAR EDGE AND FINE STRUCTURAL STUDIES OF
TRANSITION METAL NANOPARTICLES**

Harish Sharma¹, Bharat Mishra², P.Sharma² and P.K. Malviya²

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Chitrakoot, Satna (M.P.), India

²Associate Professor, Dept. of Physical Sciences, Mahatma Gandhi Chitrakoot Gramodaya
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²Dept. of Physics, Govt. Holkar Science College, Indore (M.P.), India

²Govt.Madhav Science College Ujjain (M.P.), India

Abstract - The X-ray absorption fine structure is typically divided into two regimes: X-ray absorption near-edge (XANES) structure and extended X-ray absorption fine-structure (EXAFS) structure. The EXAFS has been known for over 80 years. There was a lot of confusion about the theory of EXAFS. The X-ray absorption spectra have been recorded using synchrotron radiation. The X-ray spectroscopic setup is available at Raja Ramanna Center for Advanced Technology (RRCAT), Indore, India and is called dispersive EXAFS beam line BL-8. This beam line has been recently commissioned at the 2.5 GeV Indus-2 synchrotron radiation sources. The transmitted beam intensity from the sample is recorded on a position sensitive CCD detector. Sample preparation is carried out by combustion assisted method. The chemical shift has been used to determine the percentage covalency values on the absorbing atom. The values of the chemical shifts suggest that copper is in oxidation state +2 in all of the complexes.

1 INTRODUCTION

X-ray absorption spectroscopy (XAS) refers to the details of how X-rays are absorbed by an atom at energies near and above the core-level binding energies of that particular atom. The absorption of X-rays on the high energy side of absorption edges does not vary monotonically in condensed matter but has a complicated behavior which extends past the edge by an amount typically of the order of 1 KeV. This non-monotonic variation has received the name of X-ray absorption fine structure (XAFS). The X-ray absorption fine structure is typically divided into two regimes: X-ray absorption near-edge (XANES) structure and extended X-ray absorption fine-structure (EXAFS) structure.

The EXAFS has been known for over 80 years. There was a lot of confusion about the theory of EXAFS. The situation changed when Sayers, Stern and Lytle (1971) pointed out, based on a theoretical expression of the EXAFS (Sayers et al., 1971) that a Fourier transform of the EXAFS function with respect to the photoelectron wave number should peak at distances corresponding to nearest neighbor coordination shells of atoms. The introduction of the Fourier

transform changed EXAFS from a confusing scientific curiosity to a quantitative tool for structure determination [1-5].

In the present paper, the X-ray absorption fine structure (XAFS) spectroscopy has been used to study transition nanoparticles. Studies have been done using XANES spectroscopies experimentally. In the present work a simple and innovative procedure for analysis of XANES data was presented. The method was demonstrated to yield satisfactory results for transition metal its sample [6-10].

The X ray K absorption near edge and fine structural studies of transition metal nano particles. There has been a lot of interest in synthesis, structure and properties of cupric nitrate and citric acid ligands [1] and in wood protection [7-14]. Transition metal complex with ligand systems containing oxygen and nitrogen donor atoms are very important class of nano particles.

1.1 Experimental

Sample preparation is carried out by combustion assisted method. The X-ray absorption spectra have been recorded

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Preface: Emerging Interfaces of Physical Sciences and Technology (EIPT-2019)

Physics is the most fundamental and all-inclusive of the sciences and has had a profound effect on all scientific and technological developments. In fact, physics is the present-day equivalent of what used to be called *Natural Philosophy*, from which most of our modern sciences arose. Physics and industry are closely related. It is true that all forms of industries are nothing, but various sections of physical sciences applied and exploited on a large scale.

Technology has been reshaping itself from time to time because advancements in science have played a vital role in inventions of new technologies. Taking this idea into account, a national conference has been organized by School of Studies in Physics, Vikram University, Ujjain on "Emerging Interfaces of Physical Sciences and Technology" to highlight the progression in this field. This two day's national conference was organized on the occasion of *Farewell of Prof. S. K. Ghosh (Head, S. S. in Physics, Vikram University, Ujjain) & 60th year of establishment of Department* on 29-30 August 2019 at S. S. in Physics. The conference covered almost all the important areas of research in physical science and technology. A special feature of the conference is its wide theme which enables us to unite researchers from various fields of physical sciences. In all, about 100 participants from various parts of the country took part in the conference and availed this opportunity to exchange advanced scientific experiences and ideas.

This volume contains research papers selected for presentations in technical sessions of the EIPT-2019. All the articles have been subjected to a peer-review process by a panel of subject experts. Only selected articles based on their quality, originality and rich content are published in this proceeding.

The fields covered in this proceedings are

- Material Science
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Theoretical and experimental x-ray absorption fine structural studies of transition metal complexes

Harish Sharma, Bharat Mishra, P. Sharma and Pramod Kumar Malviya

AIP Conference Proceedings **2224**, 030011 (2020); <https://doi.org/10.1063/5.0000696>

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A. M. Shaker, T. Lilly Shanker Rao, T. Shanker Rao and K. Venkataraman

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Propagation of longitudinal electro-kinetic waves in III-nitride semiconductor with participating ion colloids

Dilip Soni, Giriraj Sharma, S. Ghosh and Yogita R. Sharma

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The role of quantum effect and density gradient on the acoustic wave propagation

Aartee Sharma, Nishchhal Yadav and S. Ghosh

AIP Conference Proceedings **2224**, 040013 (2020); <https://doi.org/10.1063/5.0000677>

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Influence of magnetic field on longitudinal electro-kinetic modes in a magnetized GaN semiconductor embedded with nano sized ion colloids

Ajay Saxena, Dilip Soni, Giriraj Sharma, Yogita R. Sharma and K. L. Jat

AIP Conference Proceedings 2224, 040021 (2020); <https://doi.org/10.1063/5.0000759>

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Subhash Chandra Kaushik and Giriraj Sharma

AIP Conference Proceedings 2224, 040022 (2020); <https://doi.org/10.1063/5.0000488>

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Biomimetic membranes: Effective tool for understanding the drug biomembrane thermodynamic interactions - A review

Kalpna Virendra Singh

AIP Conference Proceedings 2224, 070001 (2020); <https://doi.org/10.1063/5.0000843>

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Swati Dubey, S. Ghosh and P. Bagdare

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Propagation of longitudinal electro-kinetic waves in III-nitride semiconductor with participating ion colloids

AIP Conference Proceedings 2224, 040012 (2020); <https://doi.org/10.1063/5.0000757>

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ABSTRACT

We present an analytical study on propagation characteristics of longitudinal electro-kinetic waves in III-nitride semiconductor with participating ion colloids.

Influence of magnetic field on longitudinal electro-kinetic mode in magnetized GaN semiconductor embedded with nano sized ion

AIP Conference Proceedings 2224, 040021 (2020); <https://doi.org/10.1063/5.0000759>

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Biomimetic membranes: Effective tool for understanding the dr biomembrane thermodynamic interactions - A review

AIP Conference Proceedings 2224, 070001 (2020); <https://doi.org/10.1063/5.0000843>

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ABSTRACT

Variety of bio membranes are present in human body, and they perform various functions ranging from protecting tissues and cells from foreign molecules, selecting the cellular penetration of compounds with biochemical or physiological role, communication, exchange

Theoretical and experimental x-ray absorption fine structural studies of transition metal complexes

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Theoretical and Experimental X-ray Absorption Fine Structural Studies of Transition Metal Complexes

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Abstract. In the present paper, the sample preparation is carried out by combustion assisted method, chemical root method and solid root method. The X-ray spectroscopic setup is available at Raja Ramanna Center for Advanced Technology (RRCAT), Indore, India and is called dispersive EXAFS beamline BL-8. The X-ray absorption spectra have been recorded using synchrotron radiation. This beamline has been recently commissioned at the 2.5 GeV Indus-2 synchrotron radiation sources. The theoretical XANES and EXAFS spectra have been calculated using BL-8 data then use some mathematical method like Levy's Method, Lytle's Method, L.S.S. Method and Fourier Transform (FT) Method. In XANES region we find out the values of Cu K-edge, sample K-edge, edge width, chemical shift, shift of principal maxima, percentage covalency and effective nuclear charge. In EXAFS region we find out the value of bond length of all the mathematical methods.

INTRODUCTION

XAFS is an intrinsically quantum mechanical phenomenon that is based on the X-ray photoelectric effect, in which an X-ray photon incident on an atom within a sample is absorbed and liberates an electron from an inner atomic orbital (e.g. 1s). The “photoelectron” wave scatters from the atoms around the X-ray absorbing atom, creating interferences between the outgoing and scattered parts of the photoelectron wave function. These quantum interference effects cause an energy-dependent variation in the X-ray absorption probability, which is proportional to the X-ray absorption coefficient, a measurable quantity. When properly decoded these modulations provide information about the structure, atomic number, structural disorder, and thermal motions of neighboring atoms [1-4].

SAMPLE PREPARATION FOR XAS

A transmission mode sample needs to absorb as many X-rays as possible to produce a high-quality absorption signal. In general for a uniform sample, transmission mode measurements are optimized when the total absorption from all atoms in the sample is less than 2.5 absorption lengths ($\mu x = 2.5$) while the partial absorption due to the absorber atoms is approximately one absorption length ($\Delta\mu x = 1$). The upper limit for the total absorption by a sample is most critical. The partial absorption should be maximized within the total absorption limit and is easily measured, as it corresponds to the step height of the absorption edge in transmission mode. An incident X-ray intensity of 10⁷, which is common for most second-generation synchrotrons, is needed to measure a sample with a total absorption length of 2.5 [5-7].