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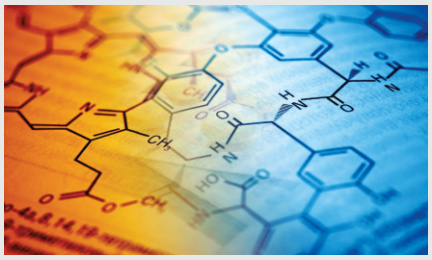

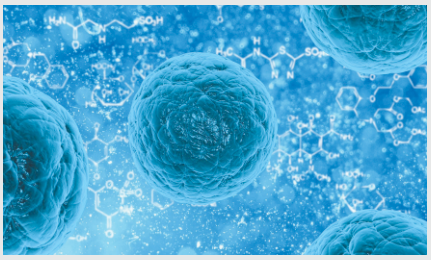

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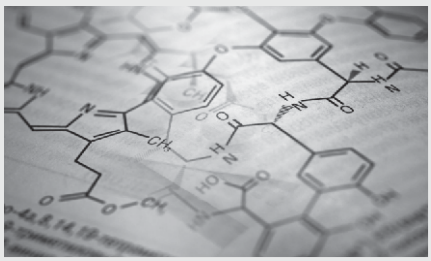

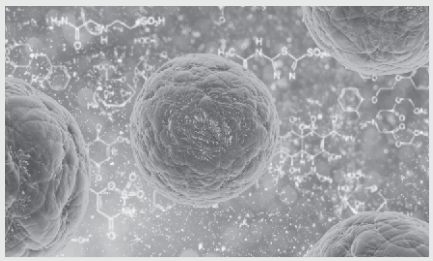

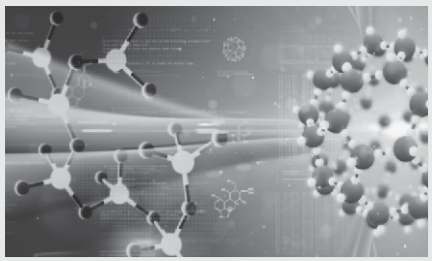

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"SYNTHESIS, CHARACTERIZATION AND BIOLOGICAL PROPERTIES OF METAL COMPLEXES OF NOVEL CROTONATES"

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Abstract : In present article, we have discussed the synthesis of the ligand, ethyl-3-(2-(2-phenoxyacetyl) hydrazono) butanoate (PHEA) and its metal complexes of transition metal ions viz; Cu^{2+}, Co^{2+}, Ni^{2+}, Mn^{2+}, and Zn^{2+} complexes. These synthesized complexes are characterized by elemental analysis, Spectral studies and magnetic moments. All the samples were monitored against common fungi for their antifungal activity.

Keywords : Butanoate, Metal Chelates, IR, NMR and Spectral Studies and antifungal activity

Introduction :

Coordination chemistry is most active research area of inorganic chemistry. Earlier Numbers of novel coordination metal complexes have been designed, and screening for their various biological activities have been reported (1-5). Hydrazide derivatives exhibit various pharmaceutical as well as biological activities such as anticonvulsant, antimicrobial, analgesic, antiplatelet, anti-inflammatory, antitubercular and antitumoral activities, etc. (6-14). In present communication comprises the synthesis, characterization and microbiacidal study of ethyl-3-(2-(2-phenoxyacetyl)hydrazono)butanoate (PHEA) and it metal complexes.

Materials and methods :

All the chemicals used in this study are of laboratory grade.

Synthesis of ligand ethyl-3-(2-(2-phenoxyacetyl) hydrazono) butanoate (PHEA) :

A mixture of 2-phenoxyacetohydrazide (0.01 mole) and ethylacetoacetate (0.012 mole) in ethyl alcohol is refluxed for 3 hrs, then poured into HCl containing ice cold water, the solid ethyl-3-(2-(2-phenoxyacetyl)hydrazono)butanoate (PHEA) separates out. The compound was then filtered, washed with ether, dried and recrystallized . Yield was 86%, m.p. 162-163^{0}C Uncorrected (Capillary method).

Analysis : $C_{14}H_{18}N_2O_4$ (278)

	%C	%H	% N
Calculated :	60.42	6.52	10.07
Found :	60.4	6.5	10.0

IR Peaks : 3030 cm^{-1} (Aromatic C-H)

28500, 2920, 1430cm^{-1} (-CH_2)

1690 cm^{-1} (-COO)

1680, 1580, 1610 cm^{-1}(-CONH)

1630-1685 cm^{-1}(-C=C)

1620-1640 cm^{-1} (C=N)

1310-1250 cm^{-1} (C-O)

1H NMR : 6.9 - 7.4 ppm (5H,m,aromatic-H)

2.1 (3H,s,CH_3)

4.6,2.7(4H,s,CH_2)

4.2(2H,q,-CH_2)

1.3(3H,t,-CH_3)

NH of CONH (not shown discernibly)

Synthesis of Complexes :

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EVALUATION OF NOVEL FUSED HETEROCYCLIC LIGANDS AND THEIR CHELATING PROPERTIES.

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Abstract : In the Present Study 2-amine-4-phenylthiazole and 5-chloroacetyl-8-hydroxy quinoline were used to synthesize novel heterocyclic ligand, 5-(3-phenylimidazo[2,1-b]thiazol-6-yl)-8-hydroxyquinoline (ITHQ). The transition metal chelates of ITHQ ligand were prepared by using Cu(II), Co(II), Ni(II), Mn(II)and Zn(II) metal ions. All the ligand and its metal chelates were characterized by spectroscopic and elemental analyses. Metal: ligand ratio and magnetic properties have also been studied. The antifungal activities samples also were evaluated.

Keywords : 2-amine-4-phenylthiazole,8-hydroxyquinoline,Metal Chelates, Spectroscopic analysis and evalution of Antifungal properties.

Intoduction :

Chelating agents [CAs] are getting an increasing importance in analytical measurements such as in gravimetric, titrimetric and colorimetric measurements. New types of CAs are constantly under investigation, for possible analytical and industrial applications (1-2). One of the complex forming reagent say, 8-hydroxy quinoline and its various derivatives show number of thera-peutic efficacy as well as antifungal activity (3-5). Amino thiazole moiety and its derivatives have been known precursors for designing bioactive molecules. As unique heterocyclic amine, 2-amino thiazole is an initial compound for the synthesis of drugs, dyes and corrosion inhibitors. More particularly these derivatives have received more attention as bioactive compounds like antimicrobial, anesthetic, antiviral, anti T.B. etc (6-10). Hence such type of heterocyclic ring and 8-HQ in one molecule may prove to be good biological active compound. Hence, the present study is quite useful in evaluating the potential use of such Chelates as Bioactive compounds. The paper deals with syntheses, characterization, chelating and microbicidal properties of 5-(3-phenylimidazo [2, 1-b] thiazol-6-yl)-8-hydroxyquinoline (ITHQ) (scheme-1).

Experimental :

5-chloroacetyl-8-hydroxy quinoline was prepared according to method reported in literature (11). Similarly 2-amine-4-phenylthiazole was also been prepared by method reported earlier (12). All the chemicals used in present study were of laboratory grade.

Synthesis of 5-(3-phenylimidazo [2, 1-b] thiazol-6-yl)-8-hydroxyquinoline (ITHQ) :

A mixture of the 2-amine-4-phenylthiazole (0.002mol) and 5-chloroacetyl-8-hydroxy quinoline (0.002mol) in anhydrous ethanol (25 mL) was stirred and refluxed for 16 h. The solution was then cooled to room temperature, the solvent was removed in vacuum, and saturated aqueous $NaHCO_3$ solution was added to make the mixture at basic (pH = 8-9). The mixture was extracted with CH_2Cl_2 (3 x 15 mL). The combined organic phases were washed with brine (10 mL) and dried with anhydrous Na_2SO_4. After removal of the solvent, the residue was stirred with ethyl ether (10 mL) and filtered to obtain novel heterocyclic ligand, 5-(3-phenyl imidazo[2,1-b]thiazol-6-yl)-8-hydroxy quinoline (ITHQ). It was insoluble in common organic solvent but soluble only in formic acid and DMSO. It melts at 196°C.

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METAL COMPLEXATION STUDIES OF NOVEL CO-ORDINATION COMPOUNDS DERIVED FROM 1,3,4-OXADIAZOLE-2-THIONE

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Abstract : The novel ligand 5-(((5-phenyl-1,3,4-oxadiazol-2-yl)thio)methyl)-8-hydroxy quinoline (OTHQ) was prepared by reaction of 5-phenyl-1,3,4-oxadiazole-2-thione with 5-chloromethyl-8-Hydroxy quinoline. The transition metal chelates of ligand (OTHQ) were prepared by using Cu^{2+}, Co^{2+}, Ni^{2+}, Mn^{2+} and Zn^{2+} metal ions. All the ligand and its metal chelates were characterized for elemental content, IR spectroscopy, metal: ligand ratio and magnetic properties. The samples also were monitored for antifungal activities.

Keywords : 1,3,4-oxadiazole-2-thione, 8-hydroxyquinoline, IR/NMR Spectroscopies, Magnetic moment, Metal Chelates, Antifungal properties.

Introduction :

In recent years, the research on synthesis and study of metal-containing compounds is become an interesting field of chemistry. (1) Organic ligands and their metal complexes played an important role in the development of coordination chemistry. They show a wide range of applications including physicochemical as well as biochemical. (2,3) One of the derivative ,5-chloromethyl-8-hydroxy quinoline (CMQ) can be synthesize easily and studied extensively for derivatives (4). Some of the ions exchanging resins are also reported with good economic potentialities (5-9). The heterocyclic compounds say derivatives of 2-amino-1,3,4-thiadiazole have interesting wide range of biological activity (10). The reaction of these derivatives with CMQ has not been reported so far. Hence such type of heterocyclic ring and the presence of 8-HQ in one molecule may act as good biological active compound. (11) In continuation of the earlier published work the present paper deals with syntheses, characterization, chelating and studies of microbicidal properties of 5-(((5-phenyl-1,3,4-oxadiazol-2-yl) thio) methyl)-8-hydroxy quinoline (OTHQ)(scheme : 1).

Materials and Methods :

5-Chloromethyl-8-hydroxy quinoline (CMQ) hydrochloride was prepared according to method reported in literature (4). 5-phenyl-1,3,4-oxadiazole-2-thione was prepared by the reported method. (10) All other chemicals used in this study were of laboratory grade.

Synthesis of 5-(((5-phenyl-1,3,4-oxadiazol-2-yl) thio) methyl)-8-hydroxy quinoline (OTHQ) :

In a round bottom flask, 5-phenyl-1,3,4-oxadiazole-2-thione (0.12mol) was added gradually to a suspension of 5-chloromethyl-8-hydroxy quinoline (CMQ) hydrochloride (0.1 mol) in THF (100ml), at room temperature. Sodium bicarbonate (0.2 mole) was added in the mixture and the mixture was refluxed on water bath for 3.5 hrs. The resulting solid mass was filtered off, washed with boiling water and the air-dried. It was dark green amorphous powder. It was insoluble in common organic solvent but soluble only in formic acid and DMSO. It did not melt up to 230°C.

Analysis :

Elemental Analysis		C%	H%	N%	S%
$C_{18}H_{13}N_3O_2S$ (335)	Calculated	64.46	3.91	12.53	9.56
	Found	64.40	3.90	12.50	9.50

IR Spectral Features (cm^{-1}) :

3350(OH), 2950 (CH2),1260,1070(ether), 2850, 1630,

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SOLAR ENERGY CONVERSION AND STORAGE IN FUCHSIN BASIC-MANNITOL DYE SENSITIZED SOLAR CELL

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Abstract : Solar energy is our Earth's primary sources of renewable energy. It is one of the most resourceful sources of energy for the future. Technology has provided a number of ways to utilize this abundant resource. It is considered a green technology because it does not emit greenhouse gases. Solar energy is abundantly available and has been utilized since long both as electricity and as a source of heat. DSS cell based on dye sensitization technique, in which electron ejection by the photosensitized dyes by randomly transferred to a vacant site where they will be localized for a period of time that depends on the trap site depth relative to the conduction bond, electron may also be transformed to the oxidized dyes. In this research article we studied on solar energy conversion and storage in Fuchsin Basic dye with aqueous solution of Mannitol. Therefore, the present study of DSS cell of Fuchsin Basic dye with efficiency enhancer chemical such as Mannitol reductant in alkaline medium is used to observed their photoelectric parameters. The observed cell performance in terms of fill factor, conversion efficiency and storage capacity.

Keywords : DSS cell, dye sensitization, fuchsin basic, mannitol, efficiency enhancer.

Introduction :

The development of viable and long-term solution to meet our energy needs that also maintains the quality of our environment which remains one of the most critical challenges is being facing by the scientific community. The solution of this challenge increasingly depends on electrochemical processes in solids. Solar energy is the most readily available source of energy. It is also the most important of the non-conventional sources of energy because it is non-polluting and, therefore, helps in lessening the greenhouse effect. The new approach for renewable energy sources has led to an increasing interest in DSS Cell because of their reliable solar energy conversion and storage capacity. DSS Cell based on dye sensitization technique, in which electron ejection by the photosensitized dyes by randomly transferred to a vacant site when they will be localized for a period of time that depends on the trap site depth relative to the conduction bond, electron may also be transferred to the oxidized dyes which are responsible to generate of electrical energy from solar energy in DSS cell. The DSS cell is based on 'photo-solar effect'. The term was, first time, used by Rideal and Williams (1925), Rabinowitch (1940, 1940), Potter and Thaller (1956) and Wolf (1960) to denote a special case of the so-called Becquerel effect, in which the influence of light on the electrode potential is due to a photochemical process in the body of the electrolyte. Rohatgi-Mukherjee et al. (1983), Dixit and Mackay (1982) and Kamet (1985) studied about various photogalvanic cells for solar energy conversion and storage. Gratzel and Regan (1981) and Albery and Archer (1977) worked on how to enhance the performance and optimum efficiency of solar cells for solar energy conversion and storage. Uses of some reductant and photosensitizer in photogalvanic cell for solar energy conversion and storage by Ameta et al. (1989). Madhwani et al. (2007), Gangotri and Lal (1996), Lal (2007), and Jana

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STUDIES ON THE STATUS OF THE BIRDS INHABITATING SANJAY POND PITHAMPUR, DIST DHAR, MP, WITH REFERENCE TO THE CHANGING ENVIRONMENT

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Abstract : The impact of climate change on biodiversity has become a hot issue. This paper reviews the effects of climate change on avian distribution, phenology and population dynamics according to the results of the latest research. Due to climate change, bird distributions have shifted towards high-latitude and high-altitude areas, which is changing more quickly than before. However, the breeding area which bird lived was changed different from the non-breeding. Global warming has set in motion and is affecting the timing of migration of birds.

Weather is of major importance for the population dynamics of birds. This review suggests that although there is a substantial body of evidence for changes in the phenology of birds, particularly of the timing of migration and of nesting, the consequences of these responses for a species' population dynamics is still an area requiring in-depth research. The potential for phenological miscuing (responding inappropriately to climate change, including a lack of response) and for phenological disjunction (in which a bird species becomes out of synchrony with its environment) are beginning to be demonstrated, and are also important areas for further research. The study of climatically induced distributional change is currently at a predictive modeling stage, and will need to develop methods for testing these predictions.

Although there is recent evidence only for regional climate-driven extinction events for birds, climate change can be considered among the major risk factors that might lead to the complete extinction of bird species. Together with (and sometimes contradicting) land-use change and demographic effects, climate change is shown to be a risk factor especially for cold-dwelling, restricted-range, and slowly adapting species.

Introduction :

Sanjay Pond is situated near Agra –Bombay road Pitampur in Dhar District , M.P. The pond is situated between two villages- Sindhi Bhondiya and Khatibhondiya. The pond is surrounded by small hills on three sides. On other side , we can see a huge wall made of stones. Sanjay pond is a man made pond having history of more than 45 years. It was started by Sanjay Gandhi.

Area of Sanjay pond :

Total distance (North- South): 2.31 km (1.44 mi)

Total distance (East-West): 1.44 km (0.895 mi)

Depth: 35-40 ft

Sustainable Development demands the concrete human visualization and realisation that the world is a system that connects space along with being a system that connects time. It focuses intricately upon the needs of the entire human race and humanity and the limitations of nature and time. The biological diversity of village ponds has a vital role to play in the process. They individually and collectively cater to the essential requirements of the entire developmental process to pave the path for the conduction of progress and development without depletion of natural resources.

Since the twentieth century, life on Earth has been faced

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ELECTROCHEMICAL QUANTIFICATION OF PIPERIDINE AT SQUARE WAVE VOLTAMMETRY

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Abstract : Electrochemical behaviour of physiologically active piperine is investigated in detail at a glassy carbon electrode modified with graphite nanopowder (GNP/GCE). Square wave voltammetry and cyclic voltammetry were used as an electroanalytical technique for the estimation of an analyte. The GNP/GCE exhibited excellent electrocatalytic behaviour for the reduction of piperine as evidenced by the enhancement of electron reduction peak current and shift of reduction potential to less negative values in comparison with bare glassy carbon electrode. The reduction kinetics was studied and experimental conditions were optimised. A voltammetric study of piperine at GNP/GCE electrode exhibited a well-defined cathodic peak in phosphate buffer at pH 6. The square wave reduction peak current of piperine was linearly increased over concentration range 5µgmL^{-1} to 17.5 µgmL^{-1}. The LOD and LOQ for piperine was calculated as 0.27 µgmL^{-1} and 0.83 µgmL^{-1} respectively. The fabricated sensor shows good reproducibility and successfully applied for the analysis of piperine in real samples.

Key words : Physiological activity; Square wave voltammetry; Cyclic voltammetry; Voltammetric sensor; antioxidative.

Introduction :

Over the last few decades, the interest of scientific community is diverted towards herbal medicines to address the challenges of reduced efficacy of synthetic drugs due to exposure of drug resistant pathogens. Among these herbal medicines a piperine, 1-[5-(1,3-Benzodioxol-5-yl)-1-oxo-2,4-pentadienyl] piperidine occupies unique position, due to its tremendous the apeutic applications (1). The chemical formula of 1-piperoylpiperidine is $C_{17}H_{19}NO_3$ (2).

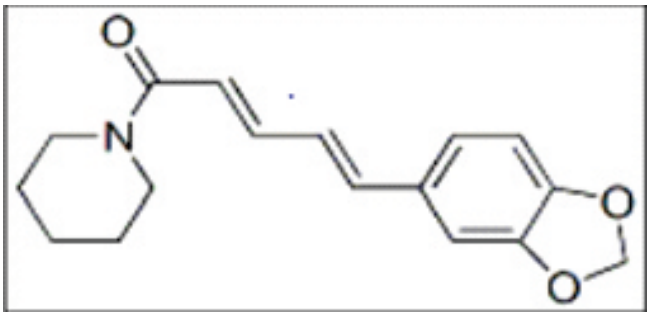

Fig. - 1 : Structure of piperine

Piperine is major bioactive constituent of black pepper (Piper nigrum) and long pepper (Piper longum) of family Piperaceae. It is responsible for the pungency of black pepper This component possesses a variety of pharmacological properties and used as antioxidant, anti-carcinogenic, anti-inflammatory (3-5), antibacterial (6,7), antimicrobial (8-10), antifungal, antiapoptotic, antidepressant, antidiarrheal (11), antitumour, anticonvulsant (12,13) agents. It triggers the appetite and production of saliva (14) and also enhances bioavailability (15) thus, promotes the adsorption of some drug and diminishing their metabolism and cholesterol level in blood (16-20). In black pepper the percentage of piperine content was recorded to vary from 2.0% to 9.0% (w/w) among different cultivators, depending on climate, growing conditions harvesting process and the method of extractions (21). Recently it is found that it posseses antiviral properties and used in the prevention of COVID-19 (22).

Literature survey reveals that electroanalytical techniques are useful for quantification of physiologically active compounds as these techniques are quick, precise, accurate,

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ELECTRO-ANALYTICAL STUDY OF FORMATION CONSTANTS OF MIXED-LIGANDS COMPLEXES OF CADMIUM(II) WITH SOME AMINO ACIDS (DL-ISOLEUCINE, L-GLUTAMIC ACID) AND 4,4,4-TRIFLUORO-1 (2-NAPTHYL)BUTANE-1,3-DIONE AT DME IN 60% ACETONITRILE MEDIUM

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Abstract : Intensive polarographic study of Cd(II) with amino acids (DL-Isoleucine, L-Glutamic Acid) and the ligand 4,4,4-trifluoro-1-(2-napthyl)butane-1,3-dione have been carried out keeping constant ionic strength (I = 1), at 308 K, by using KNO_3 in 60% Acetonitrile media. It was found that the reduction of all the systems taken, are diffusion controlled and reversible involving two electrons. For the simple system of Cd(II) with 4,4,4-trifluoro-1-(2-napthyl)butane-1,3-dione and Cd(II) with amino acids, the stability constants were determined first by DeFord and Hume and then evaluated by Schaap and McMaster method.

Keywords : Amino acids, Metal complexes, Reduction polarographic reversible Mixed-ligands complexes.

Introduction :

Metal ion, in solution, with two or more different ligands form mixed-ligand complexes. In biological active substance, mixed chelation generally takes place as millions of potential ligands are about to compete for metal ions, thus these mixed-ligands complexes play an important role in many of the biological processes. Amino acids shows great signiűcance in pharmaceutical and biological űelds and are well known for their strong tendency to form complexes with transition metal ions, also they are directly involved in all the enzymatic metabolic processes. The amino acids—metal ion complexes are used in pharmacy, cancer therapy, and industry (1). Amino acids, because of having good chelating ability with transition metal ions, part an important role in pharmacy and biology (2-3).

Glutamic Acid is a key compound in cellular metabolism. In humans, dietary proteins are broken down by digestion into amino acids, which serve as metabolic fuel for other functional roles in the body. A key process in amino acid degradation is transamination, in which the amino group of an amino acid is transferred to an α-ketoacid, typically catalysed by a transaminase.

L-Glutamic acid and Isoleucine are used as strong ligands in the study where L-Glutamic acid (4) is one of the naturally occurring proteinogenic amino acids. It is of great importance in metabolism as it participates in the pyrimidines and purine biosynthesis. It may help control blood sugar. It may also boost energy and endurance. It's also said to help speed healing of injured muscles. Isoleucine may also help muscle development and lean body mass. Isoleucine is an essential amino acid. It may help how haemoglobin is made. This is the oxygen-carrying pigment inside of red blood cells. It may help control blood sugar. It may also boost energy and endurance. It's also said to help speed healing of injured muscles. Isoleucine may also help muscle development and lean body mass. Most of the Cd available is used in Ni-Cd batteries and the remaining is used mainly for pigments coating and plating and as stabilizers for plastics (6-7). Cadmium has the ability to absorb neutrons so it is used as a barrier to control nuclear fission. Cadmium is amongst the most toxic of the heavy metals. It primarily affects the cardiovascular system, the kidney, and is related to diabetes, cancer, and heart diseases. Many authors calculated the stability constants of Pb(II) and Cd(II) ion with some of the amino acids and some bicarboxylic acids at DME at the

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EXPLORING THERMAL GRAVIMETRIC ANALYSIS DATA TOWARDS THE DETERMINATION OF NON-ISOTHERMAL KINETICS OF OXALIC ACID

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Abstract : Oxalic acid is a well-known carboxylic acid having widespread utility in organic synthesis as well as in the material science as a doping agent is investigated by using thermogravimetric analysis. The present study deals with an elegant exploration of the resulting thermal proűle to disclose the pattern of thermal degradation of oxalic acid. Furthermore, non-isothermal kinetic investigations providing sound information about kinetic parameters, such as activation energy and frequency factor by using the Coats–Redfern equation was performed.

Keywords :

Introduction :

Bamford and Tipper [1] in their book entitled "comprehensive chemical kinetics" accounts a historical development in the field of solid state kinetics. The book uncurtains the nature and the importance of thermal decomposition as a function of temperature. In general usage, a more restricted meaning of the definition of thermal decomposition has become acceptable and is specifically applied to those processes in which bond redistribution yields a solid residue of different chemical identity from that of the reactant.

Thermogravimetric analysis (TG) in this regard, is the process in which the study of the weight changes of a specimen or sample as a function of temperature. The technique is useful strictly for transformations involving the absorption or evolution of gases from a specimen consisting of a condensed phase. In addition to that differential thermal analysis data reveals the temperature difference between a reactive sample and a non-reactive reference is determined as a function of time, providing useful information about the temperatures, thermodynamics and kinetics of the decomposition reactions [2].

It has been envisaged that the fundamental concept of chemical kinetics is based on the law of mass action established by Cato M. Guldberg (1836–1902) and Peter Waage (1833–1900) in the latter half of the nineteenth century [3, 4]. Many solid-state kinetic models have been developed in the past century. Some models were based on mechanistic grounds while others lacked theoretical justification and some were theoretically incorrect. Models currently used in solid-state kinetic studies are classified according to their mechanistic basis as nucleation, geometrical contraction, diffusion, and reaction order. However, the brief theory of these solid state kinetics is given below.

The rate of a solid-state reaction can be generally described by

$$\frac{d\alpha}{dt} = Ae^{-(Ea/RT)} f(\alpha) \qquad \text{..... (1)}$$

where, A is the pre-exponential (frequency) factor, Ea is the activation energy, T is absolute temperature, R is the gas constant, f(á) is the reaction model, and R is the conversion fraction. For a gravimetric measurement, á is defined by

$$\alpha = \frac{m_0 - m_t}{m_0 - m_\infty} \qquad \text{..... (2)}$$

where, m0 is initial weight, mt is weight at time t, and m″ is final weight.

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Electro-analytical Studies of Formation Constants of Mixed-Ligands Complexes of Cadmium(II) with Some Bio-potentially important Amino Acids (L-Valine, L-Aspartic Acid) and 4,4,4-Triűuoro-1(2-Napthyl) Butane-1,3-Dione at DME in 60% Acetonitrile Medium

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Abstract : Intensive polarographic study of Cd(II) with amino acids (L-Valine, L-Aspartic Acid) and the ligand 4,4,4-trifiuoro-1-(2-napthyl)butane-1,3-dione have been carried out keeping constant ionic strength (I = 1), at 308 K, by using KNO3 in 60% Acetonitrile media. It was found that the reduction of all the systems taken, are diffusion controlled and reversible involving two electrons. For the simple system of Cd(II) with 4,4,4-triűuoro-1-(2-napthyl)butane-1,3-dione and Cd(II) with amino acids, the stability constants were determined űrst by DeFord and Hume and then evaluated by Schaap and McMaster method.

Keywords : Amino acids, Metal complexes, Reduction polarographic reversible Mixed-ligands complexes.

Introduction :

Metal ion, in solution, with two or more different ligands form mixed-ligand complexes. In biological active substance, mixed chelation generally takes place as millions of potential ligands are about to compete for metal ions, thus these mixed-ligands complexes play an important role in many of the biological processes. Amino acids shows great significance in pharmaceutical and biological fields and are well known for their strong tendency to form complexes with transition metal ions, also they are directly involved in all the enzymatic metabolic processes. The amino acids—metal ion complexes are used in pharmacy, cancer therapy, and industry (1). Amino acids, because of having good chelating ability with transition metal ions, part an important role in pharmacy and biology (2-3).

L-Aspartic Acid and L-Valine are used as strong ligands in the study where L-Aspartic Acid (4) is one of the naturally occurring proteinogenic amino acids. Valine is an essential amino acid, meaning the human body cannot synthesize it. In the human body, aspartate is most frequently synthesized through the transamination of oxaloacetate. The biosynthesis of aspartate is facilitated by an aminotransferase enzyme: the transfer of an amine group from another molecule such as alanine or glutamine yields aspartate and an alpha-keto acid. Aspartate also plays an important role in the urea cycle.

Valine is an aliphatic and extremely hydrophobic essential amino acid in humans related to leucine, Valine is found in many proteins, mostly in the interior of globular proteins helping to determine the three-dimensional structure. A glycogenic amino acid, valine maintains mental vigor, muscle coordination, and emotional calm. Valine is obtained from soy, cheese, fish, meats, and vegetables. Valine supplements are used for muscle growth, tissue repair, and energy. Most of the Cd available is used in Ni-Cd batteries and the remaining is used mainly for pigments coating and plating and as stabilizers for plastics (6-7). Cadmium has the ability to absorb neutrons so it is used as a barrier to control nuclear fission. Cadmium is amongst the most toxic of the heavy metals. It primarily affects the cardiovascular system, the kidney, and is related to diabetes, cancer, and heart diseases. Many authors calculated the stability constants of Pb(II) and Cd(II) ion with some of the amino acids and some bicarboxylic acids at DME at the requisite temperature (8-10). Formation constant of Cd(II) with penicillamine and Histidine have been studied by Jadwiga et al. (11). Paliwal

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THE ASSESSMENT OF INDUSTRIAL EFFLUENTS COLLECTED FROM THE VAPI INDUSTRIAL AREA OF GUJRAT (INDIA)

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Abstract : This work aims to assess the water quality of Vapi industrial area of Gujrat state (India) by analysing sixteen important physicochemical parameters. The pollution level in pre-monsoon and post-monsoon of each effluent is compared with the WHO and Indian Standard Institution guidelines.

Keywords : Industrial effluent, physicochemical parameter, WHO, Vapi GIDC.

Introduction :

A large amount of wastewater is generated due to industrialization leads to environmental pollution (1,2). The discharge of wastewater from industries such as textiles, pharmaceuticals, dyes, fine chemicals, pesticides, agrochemicals etc. pollutes the water bodies (3). Vapi industrial area is one of the largest industrial regions of Gujrat state with many industries. The present research work deals with the study of physicochemical parameters like pH, conductivity, Total hardness, Alkalinity, Chloride, TSS, TDS, Calcium, Magnesium, Sodium, Potassium, Sulphate, Nitrate, Phosphate, BOD and COD of collected industrial effluents. Pre-monsoon and the post-monsoon collection were carried out, and variations in industrial effluents were recorded. It is seen that at most of the sampling stations, some parameter contents observed were somewhat above the permissible level. After the rainy season, the pollution status was little less indicating the dilution due to rainwater in the environment.

Material and method :

The samples were collected from various sampling sites of Vapi industrial area of Gujrat state. The sampling was carried out in summer and winter to understand the physicochemical quality of the industrial effluent. All the effluent samples were collected in the plastic cans of two litres as per standard procedures of APHA. The physicochemical parameters such as pH, conductivity, Total hardness, Alkalinity, Chloride, TSS, TDS, Calcium, Magnesium, Sodium, Potassium, Sulphate, Nitrate, Phosphate, BOD, COD, were determined using the standard method (4). All the reagents used were of analytical reagent grade, and all solutions were prepared in metal-free distilled water. The estimated parameters compared with WHO, BIS and CPCB standards.

Result and Discussion :

The analysed physical and chemical parameters were tabulated along with the standard values in tables 1 and 2 for pre-monsoon and post-monsoon study.

pH :

The collected samples were found to be alkaline having pH within limits from 6.39 to 9.10 in summer, and the pH varies from 7.10 to 9.40 in winter. The permissible pH value suggested by WHO ranges from 6.5-8.5. The variation in pH due to dissolved chemical compounds and biochemical reactions. Many metals are insoluble and accumulate in the sludge and sediments at high pH, and toxic effects of heavy metals are increased at a particular pH (5).

Conductivity :

The conductance varied from 0.5 to 14.9 mmho/cm being more in summer than winter. After the monsoon, these values ranged from 0.9 to 15.2 mmho/cm this due to dilution by rainwater in the environment. However, limits prescribed by WHO is 1.4 mmho/cm. The conductivity of water is an essential parameter for irrigation. It indicates

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STUDIES OF ELECTRICAL CONDUCTANCE AND ANTIBACTERIAL ACTIVITY OF SYNTHETIC MEMBRANE

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Abstract : The study of electrical conductance across parchment-supported Iron tungstate membrane in various 1:1 electrolytes has been experimentally determined in order to evaluate selectivity of membrane using the values of the intramembrane permeability ratio. The antibacterial activity of newly synthesized membrane was studied against Escherichia coli, Pseudomonas aeroginosa and Staphylococcus aureus by the agar well diffusion method. The membrane was characterized by Scanning electron microscopy (SEM), Transmission electron microscopy (TEM) studies, Fourier transform infrared (FTIR) spectroscopy, Thermogravimetric analysis (TGA)/ Differential thermal analysis (DTA), X-ray diffraction (XRD) and Elemental Analysis.

Keywords : Iron tungstate membrane, Antibacterial activity, Electrical conductance

Introduction :

The synthetic membranes shows a lot of applications in different fields like foods, drugs, dairy, and beverages, as well as pollution control, waste water treatment, fuel cells, etc. Consecutively, it also uses, in many another processes like electrochemical separation, membrane electrolysis and electro-deionization (1-3). The role of the membrane between the electrodes is the conduction of produced proton from anode to cathode and acting as a barrier to crossover of fuel (4-6). The electrochemical characteristics and electrical conductance of the membrane depends on the nature of membrane forming materials, structure of membrane and concentration of the electrolytic solution in which membrane is operated (7). The complete physicochemical characterizations are used to analyze the important parameters of membrane like ion-exchange capacity, water content nature, structural and transport properties, porosity, thickness, and thermal stability (8-12).

Many studies have been conducted to the surface modiűcation of the parchment supported membrane to improve its antibacterial property. Various strategies have been attempted, including hydrophilic surface grafting to minimize the interaction between bacteria and membrane surface, incorporating leachable biocides onto the membrane surface, and immobilizing antibacterial agents for contact killing (13–18).

In this work, we describe the preparation of parchment supported Iron tungstate membrane and using the conductometric measurements to determine the selectivity of different (1:1) electrolytes using the intramembrane permeability values. While the Gram-negative bacteria (Escherichia coli, Pseudomonas) and the Gram-positive bacteria (Staphylococcus aureus) are used as model bacteria to evaluate antibacterial property of the parchment supported membrane.

Materials and methods :

Sodium tungstate (E. Merck, Mumbai, India), Ferric chloride (E. Merck, Mumbai, India) parchment paper (Amol Group of Companies Mumbai, India). All other reagents used were of analytical reagents grade. All of these electrolytes were monovalent (1:1).

2.1 Membrane preparation :

Parchment supported Iron tungstate synthetic membrane

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ANTIMICROBIAL AND SOCIO-HISTORICAL STUDIES OF SOME NEWLY SYNTHESIZED AND ANALYZED HYDRAZONE COMPLEXES OF Pr (III).

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Abstract : Two entirely new Pr(III) Hydrazone complexes were synthesized bearing the formulae Pr(III)(DPPDH)(BF4)2 and Pr(III)(DCPDH)(BF4)2 where (DPPDH) = (2, 6-diacetyl pyridine-N, N'-pyridine 2,6-dicarboxyloyl dihydrazone), (DCPDH) = (2, 6-dicarbonyl dichloride-N, N'-2, 6-dicarboxyloyl dihydrazone) and (BF4)2(Bis tetra fluoro borate). These complexes were analyzed firstly by preliminary studies like melting point determination, recrystallization, TLC, molecular weight determination. Then these complexes were analyzed by Elemental studies, Spectroscopic studies viz. IR spectra, UV-Visible studies, NMR spectra. The results confirmed the octahedral structures of the complexes. Further the complexes were screened for their antimicrobial studies against bacteria S.alternaria and E. coli and fungi C.albicans and A.flavus. The complexes showed two times more biocidal activity than their ligand. These microbes used to affect lakhs of people of our country till about ten to fifteen years ago. It used to cause social anxiety and phobia from bacterial and fungal infections. Historically there were very few clues about the cause of these infections. Previously these illnesses were considered almost incurable. Now there are medications and antimicrobial compounds which can control the spread of these microbes.

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Introduction :

Hydrazones have been proved to be a significant type of biologically active drug molecules due to their versatile pharmacological properties. Many hydrazone derivatives have been reported to exert notably biological activities. (1, 2). Hydrazones have an azomethine -NHN = CH group. These have exhibited wide interest due to their diverse biological applications viz. anti-convulsant, anti-depressant, anti-malarial, anti-microbial, anti-cancer, analgesic, anti-inflammatory, anti-platelet, anti-mycobacterial, vasodilator, anti-helmintic, anti-HIV, anti-viral and anti-diabetic activities.(2-10). Some hydrazones have also been used as insecticides, rodenticides, nematocides, herbicides, plant growth regulators and also as plasticizers and polymer-stabilizers. Many hydrazones were found to be potential inhibitors of anthrax legal factor.

Materials used :

All the chemicals used were of Analytical Reagent grade.

Experimental :

(b) Synthesis of complex II: 0.01 M of the ligand, 0.01 M of praseodymium acetate and 0.01 M of 2,6-pyridine dicarbonyl dichloride were mixed in a R.B. flask using propylene glycol as solvent and the mixture was refluxed over water-bath for around 3 hours. Thereafter, the contents of the mixture were cooled, filtered when yellow crystals separated out. The crystals were dried over anhydrous CaCl2 in a desiccator. Then these were weighed to constant weight.

Yield : 1.88 gm.

Colour : Yellow

Melting point: 245 C.

Results and Discussion :

The synthesized ligand and its two complexes were analyzed firstly by preliminary studies and then by spectroscopic studies.(I) Preliminary studies: The

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CANCER NANOTHERAPEUTICS : AN INNOVATIVE DRUG DELIVERY SYSTEM

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Abstract : The term nanoparticle is a collective name for both nanosphares and nanocapsules. Drug is confined to a cavity enclosed by a unique polymer membrane called nanocapsules, while nanospheres are matrix systems in which the drug is physically and uniformly dispersed. Where a conventional technique reaches their limits, nanotechnology provides opportunities for the medical applications. The advancement of nanotechnology has made nanoparticles a promising candidate for controlled drug delivery systems for metastasized and non metastasized cancer a promising treatment. This review mainly focuses on nanoparticle-based DDS fabricated specifically target oriented cancerous tissues and selected anticancer candidates.

Key words : Nanoparticle-based DDS, Nanoparticles (NPs), Cancer Cell Targeting

Introduction :

The prefix "nano" comes from the ancient Greek vavoc through the Latin nanus which means very small. Nanoparticles (NPs) are defined as particulate dispersions or solid particles drug carrier that may or may not be biodegradable. The drug is dissolved, trapped, encapsulated or connected to a nanoparticle matrix. The term nanoparticle is a collective name for both nanosphares and nanocapsules. Drug is confined to a cavity enclosed by a unique polymer membrane called nanocapsules, while nanospheres are matrix systems in which the drug is physically and uniformly dispersed. Where a conventional technique reaches their limits, nanotechnology provides opportunities for the medical applications.

Nanoparticles (NPs) are small particles that range in size from 10 nm to 1000 nm. They contain nanomolecular materials in which active ingredients are dissolved, entrapped, and/or encapsulated. At present, NPs can be found in hundreds of different consumer products ranging from sunscreen and air conditioners to processed food

supplies.1, 2 Over the past few decades, NPs have gained recognition in the medical field as an effective means of drug delivery and therapy.3 Nanometer size range can effectively alter a substance's physical, chemical, and biological properties.4 On the other hand, NP surface properties can be altered through the utilization of various substances such as polysaccharides, proteins, and polymers.5 The size and surface properties of NPs can be optimized for

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DETECTION OF HEAVY METALS AND THEIR ACCUMULATION IN WATER AND SOIL THROUGH ELECTRO PLATING INDUSTRIES BY ICP-AES TECHNIQUE.

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Abstract : The detection of heavy metals (Viz. Pb, As, Cd, Ni, Cu, Fe, Zn, Cr) and their accumulation have been studied in electroplating industrial waste water. This work describes the detection of concentration of these metals in industrial waste water by ICP-AES (Inductively Coupled Plasma Atomic Emission Spectroscopy) technique. In electroplating industrial waste water samples Pb, As, Ni, Cu, Fe, Cr are detected while Cd, Zn, As, Cu are detected in trace amount in some samples. For the accumulation of metals by the waste water samples were collected and analysed. This concentration of metals is due to various electro plating industries. The waste water samples were collected from MIDC, Ambad, Nashik. Maharashtra. At this point the soil is getting polluted by the disposal of different electro plating industrial waste water. Detected some of the metals are toxic.

Keywords : Accumulation, Heavy Metals, ICP-AES, waste water, detection

Introduction :

Industrial growth is an essential feature of the developing country. Without industrial growth a nation can not stand amongst the global scenario. Due to this rapid industrialization environmental pollution is becoming the most challenging threat to human beings (1,2). Pollutants in various forms are thrown into the nearby areas by industries. These pollutants pollute the air, soil, surface water as well as ground water (3). The industrial activities have contributes quantitatively as well as qualitatively to the large increase in the discharge of metallic pollutants into environmental sink. The heavy metals present in industrial effluents interact with organic and inorganic species and form complexes. Insoluble complexes are deposited on the surface of the soil but soluble complexes formed have a tendency to percolate through the soil (4) which affects the quality of the ground water and soil.

For this study the samples were collected from MIDC, Ambad, Nashik located in Maharashtra. In this industrial area most of the industries are electroplating industries which are being discharged the effluent into open places. Most of the industrial waste water are containing organic, inorganic matter and hazardous metals (5). These heavy metals and organic compounds affect the quality of soil and ground water of the area. The heavy metals like Pb, As, Cd, Ni, Cu, Fe, An and Cr and some water soluble pollutants percolate into the ground water (6). Due to industrialization and urbanization pollution growth all the sources of water are either polluted or contaminated (7). Release of treated and untreated industrial effluents in unplanned manner is one of the major causes of water pollution. The effluents which are released into various surfaces water bodies not only affect the water quality and soil but also pollute the ground water due to percolation of some water soluble pollutants (8).

The main objectives are to understand and evaluate water quality to control and minimize the incidence of pollutant oriented problems and to provide water of appropriate quality of various water users ass urban water supply, irrigation water, municipal water supply etc. In order to keep the quality of water at an optimal level, continuous periodical

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A REVIEW: ORGANIC COMPOUNDS IN THE ENVIRONMENT

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Abstract : The present Paper deals with the study of organic compound in the environment. These compounds are important because all living organisms contain carbon. Organic compounds are of three types, Volatile Organic Compounds (VOC's) Non Volatile Organic Compounds (NVOC's), Semi Volatile Organic Compounds (SVOC's). Fourth one is Persistent Organic Pollutants (POPs) are chemicals that are highly toxic, persistent and bioaccurnulate in the environment. The present study includes the sources, Harmful effects of these organic compounds to the environment and human being, also include the composition of organic compounds and their Preventive measures and their removal methods.

Keywords : Organic compounds, Environment, VOCS, NVOCEs, SVOCS, POPS, Sources, Harmful effects

Introduction :

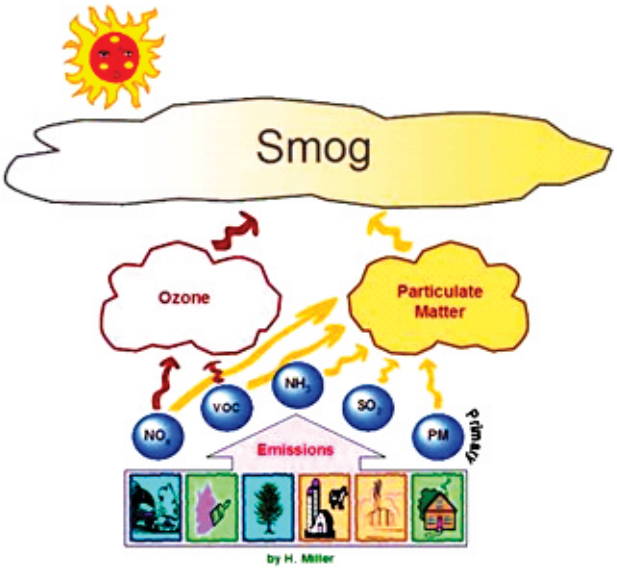
Environmental Chemistry is the study of sources, reactions, effect and fate of chemical species in the air, water and soil and the effect of human activity upon these. The scientific community and the public have become aware of and are concerned about the presence of toxic substances in their working and living environment and about the health impact of those substances (7). The amended soils have a variety of organic compounds (1) These organic compounds affect the quality of soil and sediment and of marine water of the area (2) These organics (3) includes hydrocarbons, phenols, pesticides, Agrochemical–chemicals etc. Numerous studies have been reported for the detection and identification of organics in western countries (4-6). There is increasing demand to evaluate the potential health risk of these substances under the conditions in which they are used. Most of these compounds are synthetic and have been made for useful purpose; however their prolonged use has become harmful. Now there is a need for their complete replacement or at least some modifications are essential in their structures or compositions so that their harmful effects may be minimized. When it is not possible to work without these substances as in case of LPG then sufficient preventive measures are required during their use (7).

Organic compound (or synthetic compound) is an organic compound that is prepared by chemical manipulations (chemical reaction).

Volatile organic compounds (VOCS) :

These are the organic compounds which evaporate easily at ordinary temperature and pressure. Sources of VOCs include vehicle emissions, fuel combustion and domestic solvent usage. They are present in paints, varnishes, waxes, coatings etc. (7). VOCs include mainly chlorofluorocarbons, Benzene, methylene chloride (CH2Cl2) Perchloro Ethylene Chloride. All these substances are volatile therefore they cause air pollution (7) which can have detrimental effect on human health. As the VOCs are air pollutants they cause irritation in eye, nose and throat, loss of coordination, damage to liver, kidney and central nervous system (7). Some VOCs are mutagenic or toxic to reproduction and harmful to unborn. They also have harmful environmental effects (crop, vegetation and materials damage, reduced visibility) when they chemically interact with oxides of Nitrogen and sunlight to form ground level zone.

The symptoms include conjunctival irritation, nose and throat discomfort, headache, allergic skin reaction, fatigue, dizziness (7). As people spend most of their time at home



its heat react with these gases and fine particles in the atmosphere smog is formed. It is purely caused by air pollution.

What organic compounds are essential to life?

Organic compounds essential to human functioning include carbohydrate, lipids, proteins and nucleotides, these compounds are said to be organic because they contain both carbon and hydrogen.

Organic compounds that are toxic to human and environment are CFCS, benzene, CH2cl2, ccl2 = ccl2. All there are volatile and causes Air Pollution.

Most organic compounds making up cells and body belong to one of four classes carbohydrates, lipids, proteins & nucleic acids. (Aug 13, 2020)

Persistent Organic Pollutants (POPs) :

Persistent organic pollutants (POPs) are a group of toxic chemicals that don't break down easily in the environment. They can be intentionally produced and used in agriculture, disease & pest control, manufacturing or industry. They can also be unintentionally produced from some Industrial processes and from waste incineration backyard trash burning, cigarette, smoke, and vehicle exhaust.

Pops can travel regionally and around the world. They bioaccumulate in the fat tissue of humans and animals, biomagnify in food chains, and are persistent in the environment.

The Stockholm convention on persistent organic pollutants is an international treaty to protect human health and the environment from pops. In 2001 it originally covered 12 pops of great concern called the "dirty dozen", aldrin, Chlordane, DDT, dieldrin, dioxins, endrin, furans, hepta-chlor, hexachlorobenzene, mirex, PCBS, and toxaphene. Another 16 additional chemicals were added to the treaty in 2017.

Non Volatile Compounds (NVOCs) :

NVOCs those that show less than 5% by weight evaporation under ambient conditions at 6 months, are generally not available to contribute to ozone (O3) formation. Methyl palmitate and glycerol are clearly non volatile, though they are often calculated as VOCs in traditional test methods.

What are non volatile compounds?

A non volatile substance refers to a substance that does not readily evaporate into a gas under existing conditions. Non volatile substance exhibit a low Vapour pressure & high boiling point. Sugar and salts are example of Non Volatile Compunds (NVOCs) solutes. e.g. of NVOC's : Soy oil, Alkyl, alkanolamine, glycerol & methyl palmitate, have boiling points of 2500c, 2830c, 2900c, 3320c respectively (16).

Non Volatile organic compounds accounts for most of the organic matter present in both raw & treated water. many of the industrial, agricultural and pharmaceutical compounds in wide spread are non volatile and undoubtedly some proportion of them find their way into aquatic environment. Studies of the organic by products of chlorination of ozonation of water have shown that a significant proportion of these are non volatile (17).

Sediment clay has been employed to remove phenolic compounds, the common pollutants in water and waste water. Removal of mythylene blue dye (MB) from aqueous solution by adsorption on river sediment. Removal of some VOCs by using low cost geomterials.

Monitoring of the organic pollution is becoming more

Instructions To Authors

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3] Paper should have the following sections [a] Abstract [b] Introduction [c] Materials & Methods [d] Results and Discussion [e] Acknowledgement [f] References.

4] All the references must in the following order :

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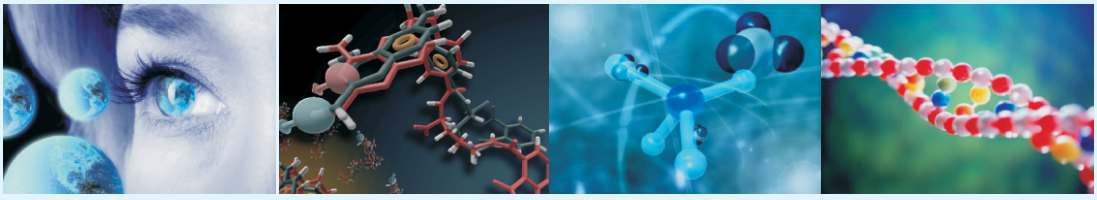

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