# Personal Profile

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|---|---|---|
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| 3. | State of Origin | :- Maharashtra |
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| 5. | Present Designation | :- Associate Professor |
| 6. | Faculty | :- Science |
| 7. | Subject | :- Chemistry |
| 8. | Date of First Appointment | :- 04/07/1992 |
| 9. | Total Experience | :- 30 Years |
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**Qualifications**:-

| Degrees | Title | University | Date of award |
|---|---|---|---|
| M. Phil. | "Separation Of Organic And Metallic Moieties From The Industrial Wastes By Using Solvent Extraction". | K. B. C. North Maharashtra University, Jalgaon | 26/6/2009 |
| Ph.D. | "Determination Of Organic And Metallic Pollutants From The Industrial Wastes By Using Solvent Extraction Method" | K. B. C. North Maharashtra University, Jalgaon | 27/07/2018 |
| D.Sc/D. Litt. | NIL | NIL | NIL |

**Training Programme Attended:-**

| Sr. No | Name of the Course | Place | Duration | Sponsoring Agency |
|---|---|---|---|---|
| 1 | Orientation Course | Punjim, Goa | 03/01/1996 to 30/01/1996 | UGC |
| 2 | Refresher Course | Jalgaon | 09/04/1997 to 06/05/1997 | UGC |
| 3 | Refresher Course | Pune | 02/03/2001 to 29/03/2001 | UGC |
| 4 | Refresher Course | Jalgaon | 12/09/2011 to 02/10/2011 | UGC |

**Teaching experience**:

P.G. Classes (in years) :**05 Year**

U.G. Classes (in years) :**30 Years**

**Research Experience: 06 Years.**

**Research Project Detail:**

| Sr. No. | Funding Agency | Title | Periods | Amount | Status |
|---|---|---|---|---|---|
| 1. | UGC WRO Pune | Separation of organic and metallic moieties from industrial wastes by solvent extraction | 2 years | 1.85 Lacks | Completed |

**List of Publication**

| Sr.No | Title of the paper with page Nos. | Journal Name |
|---|---|---|
| **1** | Solvent extraction of Industrial wastewater.Vol.4 (2), **2011.** | Asian J. of Chemical and Environmental Research. |
| **2** | Determination of physico-chemical parameters and statistical evolution of wastewater effluents from Satpur MIDC, Nasik,India.Vol.6(3-4), **2013** | Asian J. of Chemical and Environmental Research. ISSN 0974-3049 |
| **3** | UV Light Induced Photo Catalytic Degradation of Malachite Green by Using Zno Nano-particles. Vol.14(2),**2014** | Journal of advances in Science and Technology ISSN 0971-9563 |
| **4** | Photo catalytic Degradation of Alizarin Red by Fe-Co Nanoparticles Prepared By Chemical Co-precipitation Method. Vol.11 No.9, **2015.** | Journal of Advances in Chemistry ISSN 2321-807X |
| **5** | Removal Of Metals From Wastewater By Using Low Cost Bio-Adsorbents. Vol.10 No.4, **2016.** | Journal of Environmental Research And Development. ISSN 0973 – 6921 ; E – ISSN 2319 – 5983 |
| **6** | Removal of Cr (VI) by using Albizia lebbeck Pods from Industrial wastewater. Volume 7, Issue 2. PP- 309-313 **2020** | International Journal of Research and Analytical Reviews (IJRAR). E-ISSN 2348-1269, P- ISSN 2349-5138 |
| **7** | Studies on Metals detection from Satpur and Ambad MIDC of Nasik by Flame Photometry techniquesVolume 8, Issue 8 . PP- 444-446 **2020** | International Journal of All Research Education and Scientific Methods (IJARESM), ISSN: 2455-6211 |
| **8** | Removal Of Basic Red Dye Using *Ipomoea Carnea* Stem Waste Activated Carbon. Volume 8 Issue 1 **2021.** | International Journal of Research and Analytical Reviews (IJRAR) E-ISSN 2348-1269, P- ISSN 2349-5138 |
| **9** | Removal of Some Pesticides from Wastewater by Using Bagasse Fly Ash. Volume 9, Issue 11 . PP- 1608-1612. **2021** | International Journal of All Research Education and Scientific Methods (IJARESM), ISSN: 2455-6211 |
| **10** | Comparative Study of Physico-Chemical Characteristics of Industrial Wastewater and Groundwater Samples. Vol. 9, Issue 5, **2022** | International Advanced Research Journal in Science, Engineering and Technology ISSN (O) 2393-8021, ISSN (P) 2394-1588 |
| **11** | Investigation of Metal detection by Inductively | International Advanced Research Journal |

| | | |
|---|---|---|
| | Coupled Plasma Atomic Emission Spectroscopy (ICP-AES)Vol. 9, Issue 5, **2022** | in Science, Engineering and Technology ISSN (O) 2393-8021, ISSN (P) 2394-1588 |

## Research Guidance:

**Ph.D. = 00**

**M. Phil = 00**

**P.G Dissertation = 15**

**Conference / Symposium/ Workshop Attended:**

| Sr. No. | Title | Conference | Organized by | Level |
|---|---|---|---|---|
| 01 | "Solvent Extraction detection…GC-MS Technique" 11-13 Feb 2011 | Biodiversity and Environmental Crises : Past, Present and future | Dept of Botany, Geog and Chem, SSVPS Dhule | International |
| 02 | "Removal of Basic Red Dyes by……Carbon"6-7 Feb 2013 | Modern Technique in Chemical Analysis | SVS Arts and Science College Dondaicha Dhule | National |
| 03 | Poster Presented on "Hazardus Pollution of Tapi" 06-08-2014 | Global Opportunity for Latest Development in Chemistry and Technology -2014 | School of chemical science NMU Jalgaon | International |
| 04 | Delivered Lecture and Guided 8-10 Feb 2004 | Aadiwasi Vadu Madava | NMU Jalgaon | University |
| 05 | Delivered Lecture and Guided on "Important topics of Chemistry " | Student counseling and Guidance | ST. Mother Teressa English School and Jr College | University |
| 06 | Poster on Pandemic and role of Pharmaceutical Chemistry. 2020 | Challenges, opportunity and Solution during COVID 19 | International federation of Fitness health Saudi Arabia and Nijampur College | International |
| 07 | Lecture Delivered on Scope and Importance of Chemistry after Graduation 02/05/2020 | Online Lecture and Guidance Session for Science Graduates | Shri. D. H. Arawal Arst, Shri Rang Avadoot Commerce and Shri. C.C. Shah and M.G. Agrawal Science College, Navapur | University |

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|---|---|---|---|---|
| 08 | Study on pesticides removal from wastewater by using bagasse fly ash July 2020 | Modern instrumentation and Characterization Technique in Applied Science | U-SERC | International |
| 09 | Investigation on UV Light Induced Photo Catalytic Degradation of Malachite Green 29-30 Aug 2020 | International Conference on Research Outlook, Innovations and Research Trends | ICROIRT | International |
| 10 | TTP 20-23 July 2020 | Online Learning: Live Classroom Teaching Platform | KBC NMU Jalgaon | University |
| 11 | Lecture Delivered on "Chemistry in Every Day Life" 07/07/2020 | Online Lecture and Guidance Session for Science Graduates | Shri. D. H. Arawal Arst, Shri Rang Avadoot Commerce and Shri. C.C. Shah and M.G. Agrawal Science College, Navapur | College |
| 12 | Delivered online lectured on "Scope and Importance of Chemistry in Pharmaceutical Industry" 01/04/2022. | Online Lecture and Guidance Session for Science Graduates | Science College Navapur | College |
| 13 | "National Science Day" 28/02/2019 | Online Lecture Science Day | Science College Navapur | College |

**Chandrakant Vedu Nandre**

'A' Grade
NAAC Re-accredited
(3rd Cycle)

# North Maharashtra University

## Jalgaon, Maharashtra, India

We, the Chancellor, the Vice Chancellor, the Members of the Management Council and the Academic Council of the North Maharashtra University, Jalgaon, certify that

**Shri.nandre Chandrakant Vedu, Mother's Name : Chitrakala**

of

**KES'S Pratap College, Amalner**

has passed the requisite examination held in **June 2009**

as a regular student, in

**A GRADE**

and found duly qualified for the degree of

# Master of Philosophy

**(In Chemistry under the faculty of Science And Technology)**

The said degree has been conferred on him/her on **February 27, 2018**
In Testimony whereof are set the seal of the University and
the signature of the Vice Chancellor.

Vice Chancellor

0006
3403

Use QR & Degree Code For Online Verification
260 1045 1

Aadhaar No. : 295873471557
2009 10 28 7 10 1 2001 7

'A' Grade
NAAC Re-accredited
(3rd Cycle)

# North Maharashtra University

## Jalgaon, Maharashtra, India

We, the Chancellor, the Vice Chancellor, the Members of the Management Council and the Academic Council of the North Maharashtra University, Jalgaon, certify that

**Nandre Chandrakant Vedu, Mother's Name : Chitrakala**

Being found duly qualified for the degree of

# Doctor of Philosophy

**(In Chemistry under the faculty of Science And Technology)**

The said degree has been conferred on him/her on **February 27, 2018**
In Testimony whereof are set the seal of the University and
the signature of the Vice Chancellor.

Vice Chancellor

0090
3503

Use QR & Degree Code For Online Verification
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Aadhaar No. : 295873471557
2017 20 25 366 100000

Asian Journal of Chemical and Environmental Research, Vol. 4 (2), 67-72, April (2011)

AJCER
Asian Journal of Chemical and Environmental Research

# SOLVENT EXTRACTION, DETECTION AND IDENTIFICATION OF ORGANICS IN WASTEWATER BY FTIR AND GC-MS TECHNIQUES

C.V. NANDRE[1] AND V.S. SHRIVASTAVA[2]

1. Department of Chemistry, Jijamata College, Nandurbar - 425 412 (India)
2. Nano Chemistry Research Laboratory, G.T.P. College, Nandurbar - 425 412 (India)

**Abstract :** We have collected industrial wastewater samples from Satpur and Ambad MIDC, Nashik (Maharashtra). The industrial wastewater sample was extracted by using $CH_2Cl_2$ and $CHCl_3$ solvents. The obtained extracted mass was recorded for different functional groups by FTIR and organic compounds by GC-MS techniques.These organic compounds adversly affects the water quality as well as human health.

**Key words :** FTIR, GC-MS, Industrial wastewater samples, Organics $CH_2Cl_2$ and $CHCl_3$ solvents.

## Introduction :

Environmental pollution is becoming the most challenging threat to human beings as a result of rapid industrilization (1-3). Areas situated around the industrial belts are under more stress due to continuous disposal of untreated wastes from various industries (4). Though many of the industries are taking active measures to controll environmental damage caused by chemical pollutants, still the problem persists (5). The water pollution by organic compounds is increasing day by day around the industrial areas of Satpur and Ambad MIDC, Nashik with their rapidly industrialization but these problems are partially unrecognized due to the few studies and surveys (6-10).

Analytical separation and recovery of organics are necessary from the variety of matrices. Solvent extraction process is an efficient method for extraction of an organic moities. Water pollution due to organic has been a major global concern for environmentalist, because some moities are nondegradable, contamination of the environment with organics from industrial wastewater is major problem due to their accumulation through food chain and persistance in nature. It is necessary to remove/separate organics from wastewater. Organics like dyes, pigments, aromatic hydrocarbons, phenols, pesticides are serious environmental pollutants, frequenty encounter in industrial wastewater of industries like pharmaceutical, textile, dying and printing, pulp and paper, sugar industries, plating paints and ink formulation etc. (11-15).

In view of the above we have detected the several organic compounds in the industrial wastewater samples collected from Satpur and Ambad, MIDC, Nashik.

## Material and methods :

All samples were collected and stored in glass bottles that had been rinsed with pentane and nitric acid to remove all organics and heavy metal residue. Wastewater samples were collected in 1 litre bottles, rinsed 3 times with the sample before filling with sample. The organics were extracted with dichloromethane ($CH_2Cl_2$) and Chloroform ($CHCl_3$) and sent to SICART, V.V. Nagar (Guj.) for GC-mass spectral and FTIR studies.

## Results and discussion :

In the present study we have analysed the wastewater samples from Satpur and Ambad MIDC, Nashik for the detection of organic compounds by GC-MS and FTIR spectroscopy.

The observed FTIR spectra are shown in fig. 1 and 2 and observed bands are tabulated in table 1 and 2 and GC-MS Spectra is shown in fig. 3 and 4. I am trying to explain the discussion of identification organic moities particularly in regard to structural and molecular formula and molecular weight. The identified organic moities are tabulated in table 3 and 4. The identified organic compounds in industrial wastewater are phenol, cis 1, 2 dihydrocatechol, Carbamic

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AJCER
Asian Journal of Chemical and Environmental Research

# DETERMINATON OF PHYSICO-CHEMICAL PARAMETERS AND STATESTICAL EVALUTION OF WASTEWATER EFFLUENTS FROM SATPUR MIDC NASIK, INDIA

**C.V.NANDRE[1] AND C.P. SAWANT[2]**

[1]Department of Chemistry, J.E.S Arts Science And Commerce College, Nandurbar - 425 412 (India)

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**Abstract :** The present research work deals with the study of some of the important physico-chemical parameters of industrial wastewater effluents collected from Satpur industrial belt of Nasik . The study reveals that engineering, fine chemical, dyes, paint, pharmaceutical, are some of the major industries responsible for polluting the surrounding aquatic environment. In the present study analysis of physico-chemical parameters like pH, EC, Sulphate, Total Nitrogen, Total Phosphorous, Nitrate, BOD,COD,DO,TDS of industrial wastewater from Satpur MIDC,Nasik were analyzed by using standard methods prescribed as in the APHA (1998).

The overall results highlight towards the discharge of highly polluted waste water effluent from Indus-tries of Satpur Industrial area of Nasik. These industrial effluents have resulted in pollution of nearby Godavari River thereby affecting the growth of vegetation and aquatic life. The results of the present investigation point out the need to implement common objectives, compatible policies and programmes for improvement in the industrial waste water treatment methods.

**Keywords :** Physico-Chemical Parameters, Water Pollution, Industrial Effluent, BOD, COD, DO, sulphate, Nitrates, Chlorides, TDS, Satpur MIDC,Nasik.

## Introduction :

Water the most vital resources for all kinds of life on this planet is also, adversely affected both quantitatively and qualitatively by all kinds of human activities. Water pollution due to rapid industrialization is the most challenging threat to human beings. Areas situated around the industrial belt are under more stress due to the continuous disposal of wastes from various industries. Though many of the industries are taking active measures to control environmental damages caused by chemical pollutants, the problem still persists.

Polluted state of the water resources has led to a steady decline in fisheries and has also affected the irrigated land. Water no longer remains a 'free good'. Availability of clean water is going to become the greatest concern for development tomorrow. In past few decades natural and polluted water have been studied in detail all over the world and considerable data are now available in most kind of pollutants and their effects on ecosystem as well as organisms. A large number of parameters signifying the quality of waters in various uses have been proposed. A regular monitoring of some of them not only prevents diseases and hazards but also checks the water resources from going further polluted.

Some salient physico-chemical parameters like, 1] pH 2] Electrical Conductivity (EC) 3]Chloride (Cl-) 4] Sulphate ( S04- ) 5] Total-nitrogen (T-N) 6] Nitrate-nitrogen (N03-N) 7]Total-phosphorous (T-P) 8] Total dissolved salt(TDS) 9] Biological Oxygen Demand (BOD ) 10]Chemical Oxygen Demand (COD ) 11] Dissolved oxygen (DO) are being described and discussed individually.

## Material and methods :

### 2.1.Area of Study

The study was carried at the Satpur industrial area which

Journal of Advances in Science and Technology
Vol 14 (2), December 2014, pp. 117-122 (ISSN No. 0971-9563)

# UV light induced photocatalytic degradation of Malachite Green by using ZnO Nanoparticles

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**Abstract**

In the present study the photocatalytic degradation of malachite green (MG), dye in presence of nanosized ZnO particles was studied. The ZnO nanoparticles were synthesized by the chemical co-precipitation method. The obtained particles were characterized by scanning electron microscope (SEM), EDAX and x-ray powder diffraction (XRD). The photocatalytic degradation of MG have been studied with the help of variety of parameters such as catalytic dose, dye concentration, pH, contact time and COD study. It was observed that the photocatalytic degradation of malachite green (MG) dye by nanosized Zno particles was an effective, economic, and faster mode of removing dye from an aqueous solution. The optimum condition for the degradation of dye was 30mg/L, pH 9, catalytic dose 0.6g/L and contact time 100 minutes. The kinetic studies also have been studied.

***Keywords:*** Malachite green Dye, Photocatalytic degradation; ZnO nano particles, SEM, *XRD*

## 1. Introduction

Semiconductor metal oxides especially ZnO with a wide band gap (3.37 eV) **[1]** and large excitation binding energy(60 MeV) **[1,2],** n-type conductivity, high isoelectric point (9.5) **[3]** and environment friendly have been used extensively for purpose of applications as microbial inhibition, photo catalysis, solar cells, removal of heavy metals **[4, 5],** gas sensors **[6].** ZnO has emerged to be efficient catalyst for water detoxification because it generates H2O2 more efficiently **[10]** and has high surface activity **[11].** Nanoparticles viz. TiO2 **have** also been used for degradation of dyes **[12]** also possess high photocatalytic efficiency **[13].** However ZnO proves to be a better photocatalyst than $TiO_2$ due to its higher efficiency of generation and mobility of photo induced electrons as well as holes **[14].**

The photocatalysed decolonization of a dye in solution is initiated by the photo excitation of the semiconductor, followed by the formation of electron-hole pair on the surface of catalyst (Eq. (1). The high oxidative potential of the hole ($h_{VB}$+) in the catalyst permits the direct oxidation of the dye to reactive intermediates (Eq. (2).

$MO/MO_2) + h\nu \rightarrow (MO/MO_2)(ec_B + K_R)$ ---(1)
Metal oxide

$h$vB + dye →dye»+ → oxidation of the dye--(2)

Another reactive intermediate which is responsible for the degradation is hydroxyl radical (OH»). It is either formed by the decomposition of water (Eq. (3) or by reaction of the hole with OH- (Eq. (4). The hydroxyl radical is an extremely strong, nonselective oxidant ($E^o$ = + 3.06 V) which leads to the partial or complete mineralization of several organic chemicals [13].

$h+_{iRB} + H_2O \rightarrow H^+ +$ »OH (3)

**$h$+vB + $OH^-$ → »OH (4)**

•OH + dye →degradation of the dye (5)

Aquaculture industries have been using Malachite Green extensively as a typical treatment by bath or flush methods without regard for the fact that topically applied therapeutants might also be absorbed systemically and produce significant internal effects. On the other hand, it is also used as a food coloring agent, food additive, medical disinfectant, and anthelminthic as well as a dye in the silk, wool, jute, leather, cotton, paper, and acrylic industries. However, Malachite Green has now become a highly controversial compound due to the risks it poses to the consumers of treated fish, including its effects

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ISSN 2321-807X

# Photocatalytic Degradation of Alizarin Red-S by Fe-Co Nanoparticles Prepared By Chemical Co-precipitation Method

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## ABSTRACT

In the present study photocatalytic degradation of hazardous water soluble alizarin red dye by using Fe-Co nanoparticles has been investigated. Fe-Co nanoparticles was synthesized by chemical co-precipitation method and characterized by TEM, SEM, EDAX and XRD. The photocatalytic degradation have been studied with the help of variety of parameters such as catalytic dose, dye concentration, pH, contact time and most important chemical oxygen demand. It was observed that The photocatalytic degradation of alizarin red dye by using Fe-Co nanoparticles was an effective ,economic, ecofriendly and faster mode of removing dye from an aqueous solution. The optimum condition for the degradation of the dye was 50 mg/L,pH 8.0, catalyst dose 60 mg/L and contact time 60 minutes. The kinetic studies also have been studied.

**Key words: -** Chemical co-precipitation; Photocatalytic degradation, Alizarin red dye; Fe-Co nanoparticles; TEM; SEM and XRD.

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**Journal of Environmental Research And Development** **Vol.10 No. 04, April-June 2016**

# REMOVAL OF METALS FROM WASTEWATER BY USING LOW COST BIO-ADSORBENTS

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*Received January 09, 2016* *Accepted May 02, 2016*

## ABSTRACT

The adsorption process is being widely used by various researchers for the removal of heavy metals from wastewater and activated carbon has been frequently used as an adsorbent. In recent years, the need for safe and economical methods for the elimination of heavy metals from contaminated waters has necessitated research interest towards the production of low cost alternatives to commercially available activated carbon. In the present investigation, feasibility of different non-conventional bio-adsorbents of plant and microbial origin waste carrot juice pulp, waste tea leaves, wood powder (saw dust), paper mill sludge and microbial bio-waste from fermentation industry were tested for the removal of metals Pb, Zn, Ni and Fe from wastewater in single metal state and multi-metallic state and were compared with activated carbon in order to develop inexpensive adsorbent.

**Key Words :** Low cost bioadsorbrnts, Microbial bio-waste, Heavy metals, pH, Contact time, Biomass concentration

## INTRODUCTION

Contamination of environment by toxic heavy metals from industrial effluents is considered to be one of the serious problems, which gets aggravated due to their accumulation in the food chain and persistent nature[1,2]. Conventional wastewater treatment technologies have been developed to reduce metal concentration in wastewater[3], which besides being cost intensive, impractical and uneconomical also causes damage to the environment. Therefore, cost effective and eco-friendly techniques are required for wastewater treatment[4,5]. Metal sorption by dead biomass is more effective than by living organisms[6]. A multitude of biomass types[7], comprising fungal biomass, bacterial biomass[8], algae[9], peat[10] and so on have been studied for removal of heavy metals from solutions/industrial effluents. The particular amount of metal bound in the biosorbent depends however not only on the chosen biosorbent but also on the type of the metal ion, its concentration and other physiochemical parameter of the solution (e.g. pH, ionic strength). Earlier studies on metal biosorption were mainly restricted to solutions containing only one metal. In the present investigation feasibility of different non-conventional biosorbents of plant and microbial origin waste carrot juice pulp, waste tea leaves, wood powder (saw dust), paper mill sludge and microbial bio-waste from fermentation industry were tested for the removal of priority metals Pb, Zn, Ni and Fe from synthetic effluents in single metal state and multi-metallic state and were compared with activated carbon in order to develop inexpensive adsorbent.

*Author for correspondence

## MATERIAL AND METHODS

### Preparation of adsorbents

Waste tea-leave and waste carrot pulp were collected from the cafeteria and juice corner, respectively. Wood powder was obtained as saw dust of *Eucalyptus* tree and paper mill sludge and microbial bio-waste were collected from Ukai Songarh pulp and paper mill and Fermentation industry, Surat, Gujarat, respectively. Activated carbon was obtained from S.D. Fine Chemicals Ltd., Mumbai, India. Waste biomass collected from different sources was dried at 70°C for overnight,

# Removal of Cr (VI) by using *Albizia lebbeck* Pods from Industrial wastewater

**Dr. C V Nandre**
Department of Chemistry,
J.E.S's. Arts Science and Commerce College,
Nandurbar-425412 (MS), India.

**Abstract**

The current work is deals with the *Albizia lebbeck* pods which has been used for the removal of chromium Cr (VI) from industrial wastewaters. The metal removal efficiency was 94 to 99%. The phenomenon of adsorption by biosorbent can be attributed to various mechanisms such as electrostatic attraction and repulsion, chemical interaction and ion exchange.

***Key words:*** Chromium Cr, Wastewaters, Pollution, Industrial Discharges and Biosorption.

## Introduction

Increasing awareness of the deleterious effects of chromium pollution has resulted in an intensive research effort aimed at understanding the interaction of the metal in natural aquatic systems and its removal in wastewater treatment processes, Chromium (VI) is introduced into the environment through industrial discharges from paint and pigment, leather tranning, electroplating, glass, ceramic, photography, textile dyeing and canning intiustries (1). In trace amounts, chromium is an essential element in the diet of some animals and presumbly of human essential element in the diet of some animals and presumbly of human being also. However, at higher concentrations all compounds of chromium are toxic (2). Over-exposure of humans to chromium dust and l mists causes irritation and corrosion of the skin and respiratory tract and probaby lung carcinoma (3). Ingestion of chromium may cause epigastric pain, nausea, vomiting, severe and diarhoea hemorraging (4). Thus, it becomes imperative to remove chromium from industrial waste water before discharging into water or onto land.

In view of the potential pollution hazard caused by hexavalent chromium several treatment methods have been suggested illcluding chemical precipitation, reverse osmosis, ion-exchange, foam fractionation etc. Lately, much interest in removing Cr (VI) by adsorption has been exhibited Activated carbon (5) being the first choice sincc it is a valuable sorbing medium but it suffers from disadvantage of its ,high

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# Studies on Metals detection from Satpur and Ambad MIDC of Nasik by Flame Photometry techniques

**Dr. C V Nandre**

Department of Chemistry, J.E.S's. Arts Science and Commerce College, Nandurbar-425412 (MS), India

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## ABSTRACT

**Current research work is focused on the investigation of metals from Satpur and Ambad MIDC of Nasik with the help of Flame Photometry techniques. The present investigation the concentration of sodium and potassium was detected by flame photometric method and the concentration of calcium and magnesium was detected by complexometric techniques.**

**Key words: Metals, Flame Photometry, Ca, Mg, Na, and K.**

## INTRODUCTION

Flame photometry is an analytical procedure by which a solution to be analyzed is atomized into a flame, and light, characteristic of the clement to be determined, is isolated and its intensity measured. In the method of flame photometry, the principles of analytical spectroscopy are applied under conditions that allow rapid determinations to be made with relatively simple apparatus and with personnel having only moderate training.

Flame photometer technique is works by atomizing a solution sample into a flame and gives a separates characteristic spectra regarding element with emission and measurement. Low excitation is get from flame-based devices which can be ranging from the 1000–3000 °C. It helps to suited for alkali metal like sodium and potassium and also helpful to alkali earth metals including calcium etc. This Flame photometer technique has unique advantages in detecting alkali and alkaline earth metals over ICP-AES, which is an expensive technique than Flame photometer technique.

## MATERIAL AND METHOD

Ca, Mg, Na, and K were tested from the collected samples with the help of conventional Flame Photometry. Selected sites for Surface water samples were collected from the various sources collection were collected, Gaurav Nitrate Pvt. Ltd. F-42, MIDC, Ambad, Kulram Chemicals W-32, MIDC, Ambad, Delta Polyster Ltd. F-6, MIDC, Ambad, Glaxo industries, Ambad MIDC, Kunal Industries J-7, MIDC, Ambad and Alpha Mech, F-101, Satpur, MIDC, Apurva Chemicals was the sampling site. Preparation of standard solution as per Indian standard Institution was prepared with an analytical reagent quality sodium chloride (NaCl).

## RESULT AND DISCUSSION

The results thus obtained are being described and discussed under the following sub-headings:

**1] Sodium (Na):**

Sodium salts are highly soluble in water and unlike Ca and Mg. There are no precipitation reactions to reduce their concentration. The concentration of sodium in natural fresh water is generally lower than that of calcium and magnesium. However, industrial waste and domestic sewage are rich in sodium and increase its concentration in natural water after disposal on land (31). Sodium has a tendency to get adsorbed on the clay particles but may be effective to exchanged by Ca and Mg. Use of irrigation water other cations will increase the exchangeable Na content of the water sample.

In the present investigation (Table-1) the concentration of Na was found to be detected in the range of 42-114 µg/g in industrial waste water samples.

# Removal Of Basic Red Dye Using *Ipomoea Carnea* Stem Waste Activated Carbon

**Dr. C V Nandre**
Department of Chemistry,
J.E.S's. Arts Science and Commerce College,
Nandurbar-425412 (MS), India.

**Abstract**

Activated carbon has been extensively used for the purpose of water purification. In particular, it has been commonly used for the removal of organic dyes from textile waste water. Discharge of organic pollutants like dyeing industry wastewater into water bodies contaminates the environment. Here we used *Ipomoea Carnea* Stem Waste activated carbon for purification of waste materials. The absorption was recorded by SEM and their results were reported which is useful to determine particle shape, porosity and appropriate size distribution of the adsorbent material.

***Key Words:*** Activated carbon, *Ipomoea carnea*, organic dyes and waste water.

## Introduction

The survival of mankind on earth is threatened by many environmental issues. Among them, industrial effluents are of much concern because of its toxic nature to the environment. The amount of waste water generated by textile industries alone works out to be 4,500 million kilo liters annually (Seleuk *et al.,* 2005, Sarita *et al.,* 2011 Pragathiswaran *et al.,* 2013). The colour affects the nature of the receiving water bodies and inhibits the penetration of sunlight into the stream thereby reducing the photosynthetic activity (Ojuz *et al.,* 2005). Dyes are reported to cause some variation in the wastewater characteristics like pH, BOD and COD (Can *et al.,* 2006). Hence, it is essential to remove dyes before it mixes with water bodies. Current methods for wastewater treatment include coagulation (Ramya *et al.,* 2008), photo catalytic degradation (Laxmi *et al.,* 2009) and bio depolarization method (Othman *et al.,* 2009). The adsorption process with activated carbon is attracted by many scientists because of the effectiveness for the removal of dyes in trace quantities. But the process has not been used extensively for its high cost. It results in a search of low cost adsorbent from agricultural and industrial waste. Such types of non-conventional adsorbents (Amian et al., 2008) used Include silk cotton hull (Gieetha *et al.,* 2009, Abita *et al.,* 2010), eucalyptus bark, orange peel, Turmeric Industrial Waste and coir pith (Sonwane *et al.,* 2008, Raffia *et al.,* 2012). The objective of this method is to investigate the adsorption capacity of the carbon prepared from *Ipomoea carnea* Stem Waste Carbon (ICSWC) to remove Basic Red dye from aqueous solution

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# Removal of Some Pesticides from Wastewater by Using Bagasse Fly Ash

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## ABSTRACT

**The bagasse fly ash obtained from a sugar industry has been used as low cost and effective adsorbent for the removal of Lindane and Malathion from wastewater. The optimum contact needed to reach equilibrium was found to be 60 min. Maximum removal takes place at pH 6.0. The removal of the pesticides increases with increase in adsorbent dose and decreases with adsorbent particle size. The optimum adsorbent dose was 5g/l of particle size 200-250 mm. Removal of these pesticides was achieved up to 97-98% under optimum conditions. The material exhibits good adsorption capacity and follows both Langmuir and Freundlich models. Thermodynamic parameters also indicate the feasibility of the method. The adsorbent is a very useful and economic for the removal of lindance and malathion.**

*Key words:* **Bagasse Fly, Pollution, Wastewaters, Pesticides, Lindane And Malathion.**

## INTRODUCTION

Water pollution by oraganic and inoraganic compounds is of great public concern (Zhang *et al.,* 2007). Adsorpation tachonology is currently being used extensively for the romoval of such pollutants from wastewaters. Among the various adsorbent systems available carbon is being widely used in developed countries (Volesky *et al.,* 1993, Kapoor *et al.,* 1995). However, the high cost of activated carbon and difficulties associated with its regeneration (Prakasham *et al.,* 1999). Limits its use in developing countries .This has led to interest in the development of low cost alternatives to activated carbon. Thus a variety of materials as adsorbent for the removal of different pollutants, have been tried by various workers (Zhang *et al.,* 1998). All the materials studied have their own advantages and limitations and therefore there is still a need for developing low cost adsorbent (Abrantes *et al.,* 2006).

Pesticides are very dangerous and harmful because of their toxic and carcinogenic nature (Modak *et al.,* 1995, Corsini *et al.,* 2008). The EEC Directive (9) for pesticides concentration in water from human consumption is 0.1 g/1. Lindane and Malathion are the two most commonly used pesticides in India and are very toxic (Arias *et al.,* 2008). The pesticides and contaminate water through agricultural. Domestic and industrial activities and therefore their removal is important. The characteristics and chemical composition of bagasse fly ash -a sugar industry waste. As a low cost adsorbent were reported earlier (Rekha *et al.,* 2006). It is reported that fly ash is stable in water, dilute acids and basses and has a surface area (BET) of 450$m^2$/ g (particle size 200-250 mm) and had successfully been tried for the removal of pollutants from aqueous solution in continuation an attempt has been made to examine the utility of this material for the removal of Lindance and Malathion from water and wastewaters.

## MATERIAL AND METHOD

**Adsorbent:** Bagasse fly ash a waste material of the sugar industry was collected from a sugar factory at Shahada. The material was treated with hydrogen peroxide at 60°C for 24h. It was then washed with de-ionized water, dried at 100 C, powdered, ground and sieved to produce particle sizes; 100-150,150-200 and 200-250 mm. The material was stored in a desiccator prior to further use. The stability of the adsorbent was determined by keeping the material over night in different solvents (water, dilute acids and bases) and determining the presence of its constituents in these solvents. The various constituents and other properties of the prepared material were determined as reported earlier *(*Zhang *et al.,* 2007*).*

**Adsorption studies:** Adsorption experiments were carried out in batch mode using a series of Erlenmeyer flasks of 50 ml capacity covered with Teflon sheets to prevent contamination. The effect of time, concentration, solution pH, adsorbent dose and temperature were studied. Isotherms were obtained by adsorbing different concentrations of lindane and malathion

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# Comparative Study of Physico-Chemical Characteristics of Industrial Wastewater and Groundwater Samples

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**Abstract:** The current investigation is the comparative study of physicochemical characteristics of wastewater and ground water samples from two different MIDC areas for five different parameters. The samples were collocated from five different sites of each MIDC area.

**Key words:** Physicochemical Characters, Wastewater, Ground water, pH Electric Conductivity etc.

## INTRODUCTION

Water the most vital resources for all kinds of life on this planet is also the resource, adversely affected both qualitatively and quantitatively by all kinds of human activities on land, in air or in water. The increasing industrialization, urbanization and development activities and consequent pollution of water has brought a veritable water crisis. Today most of the rivers of world receive millions of litres of sewage, domestic waste, industrial and agricultural effluents containing substances varying in characteristics from simple nutrients to highly toxic substances (Shrivastava, V.S. and Patel S.S 1999, Singh et al., 2001 and Shahbazi et al., 2009). The fate of ground water is also same in most of the areas (Mehta Kiran 2011 and Vikas et al., 2013). The industry continues to be one of the most significant causes of pollution of aquatic ecosystems due to a diverse kind of wastes produced by industrial waste. Most of the major industries have treatment facilities for industrial effluents. But this is not the case with small scale industries, which cannot afford enormous in-vestments in pollution control equipment as their profit margin is very slender (Elizabeth et al., 2005).

Pollution of water is responsible for a very large number of mortalities and incapacitations in the world (Murhekar et al., 2011). Polluted state of the water resources has led to a steady decline in fisheries and has also affected the irrigated land. Water no longer remains a 'free good'. Availability of clean water is going to become the greatest constraint for development tomorrow. In past few decades natural and polluted water have been studied in detail all over the world and considerable data are now available in most kind of pollutants and their effects on ecosystem as well as organisms (Elizabeth et al., 2005 and Chauhan et al., 2009). A large number of parameters signifying the quality of waters in various uses have been proposed. A regular monitoring of some of them not only prevents diseases and hazards but also checks the water resources from going further polluted (Massed et al., 2009).

This paper based on chemical composition of wastewater at several collectors site, from Satpur MIDC, Nasik and Ambad MIDC, Nasik**.** Possible relationships between concentrations of various chemical residues in wastewater and with pollution sources are also investigated between both study areas. The study deals on daily measurements of chemical parameters at five sites, of Satpur MIDC, Nasik and Ambad MIDC, Nasik.

## MATERIAL AND METHOD

Some salient physico-chemical parameters like, pH, Electric Conductivity (EC), Chloride (CI"), $SO_4$" and Total-nitrogen (T-N) are investigated as per standard methodology (Vijender et al., 2006, Nwidu et al., 2008 and Nkansah et al., 2009).

## RESULT AND DISCUSSION

Physico chemical characteristics are best indicator of pollution. The physico chemical parameters were analysed for samples collected from various sites of Satpur and Ambad MIDC, Nashik. The results thus obtained are being described under the following sub headings:

**1] pH:** During prsent study the pH of industrial wastewater samples from Ambad MIDC varies between 7.9 - 8.6, while the pH of industrial waste water samples from Satpur MIDC varies between 6.9 - 8.9.(Table 1-2).

**2] Electrical Conductivity :** The electrical conductivity of industrial wastewater samples of Ambad MIDC varies between 1400-2020 µmhos/cm while in industrial wastewater samples from Satpur MIDC varies between 1000-1940 µmhos/cm. .(Table 3-4).

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# Investigation of Metal detection by Inductively Coupled Plasma Atomic Emission Spectroscopy (ICP-AES)

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**Abstract:** Inductively Coupled Plasma Atomic Emission Spectroscopy (ICP-AES) methods are used for the detection of metals in the study area of Satpur and Ambad MIDC of Nasik. Cu, Zn, Cd, Pb, Hg, As, Ni, Fe, Ni, Cu and Mn are studies at ten sampling sites. It was found that heavy metals like Hg, As, Cr, Ni, Cd, Pb, Zn and Cu ions are serious environmental pollutants frequently encountered in industrial waste water from textile dyeing and printing, pesticide, chemicals, pulp and paper, sugar industries etc.

**Key words:** Metals, ICP-AES, Pollution, Hg, As, Cr, Ni, Cd, Pb, Zn etc

## INTRODUCTION

Water pollution due to hazardous heavy metals has been a major global concern for environmentalist because some moities are non-degradable. It is well perceived that there is a permissible limit for each metal, above which they are generally toxic and some are even hazardous. Contamination of environment with heavy metals from industrial waste water is a major problem (Baruch et al., 2000). Due to their accumulation through food chain and persistence in nature, it is necessary to remove heavy metals from the wastewater.

The industrial wastewater causes soil, river and groundwater pollution besides causing a number of adverse effect on agriculture produce, animal and health of people living in neighboring area, since it contains waste chemicals and toxic heavy metals (Jarup et al., 2003). The effluent from industry contains variety of organic and toxic heavy metals depending upon the nature of raw materials used and manufacturing processes adopted.

The heavy metals present in industrial effluents interact with organic and inorganic species and forms complexes. Insoluble complexes are deposited on the surface of the soil but the soluble complexes formed so far have a tendency to percolate through the soil strata (Shrivastava et al., 1999, Modia et al., 2003) which affect the quality of groundwater and soil gets deteriorated influencing the plant growth in the area (Mathur et al., 1998). A considerable amount of work has been carried out on these aspects (Kakatia et al., 1990 and Mathur et al., 1998).

Heavy metals are those whose densities greater than 59 $cm^3$ and light metals are those whose densities less than 5 $cm^3$. Many trace metals are essential at low concentrations for normal life but beyond the concentration limit they have high toxic potential to man. Once made available to the environment, metals are not usually removed rapidly, nor are they readily detoxified by metabolic activity.

As a result they accumulate. Metals enter in human body by different pathways and causes harmful effects (Nisha et al., 1994). Different metals create different problems in the human bodies. Higher concentration of metal ions in drinking water causes physiological disorders; many of them are quite serious. These metals have cumulative effects. The adsorption of metals in body system is high and excretion is slow. There are numerous reports on the harmful effects of heavy metals and have been reviewed by several authors (Mishra et al., 1992).

Many of the scientists including reported about the concentration of hazrdous metals and organic matter in the soil. They have concluded that metals and organic matter in industrial waste water percolate through the soil strata and affect the groundwater of the adjoining area (Trivedy et al., 1992, Palaniappan et al., 2003, Reddy et al., 2005). Therefore it has been considered worthwhile to investigate the strength of metal ions in industrial waste water to study their effects on nearby soil and ground water samples by ICP-AES techniques. This paper based on detection of metals from wastewater and industrial area water of Satpur MIDC, Nasik and Ambad MIDC, Nasik. Ten different metals have been studied with the help of ICP-AES from 10 different sites.

## MATERIAL AND METHOD

Out of the large number of metal ions detected qualitatively in the industrial waste water, our investigations were focused for a variety of reasons only on a few of these viz; Cu, Zn, Cd, Pb, Hg, As, Ni, Fe, and Cr were detected by ICP-AES.

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