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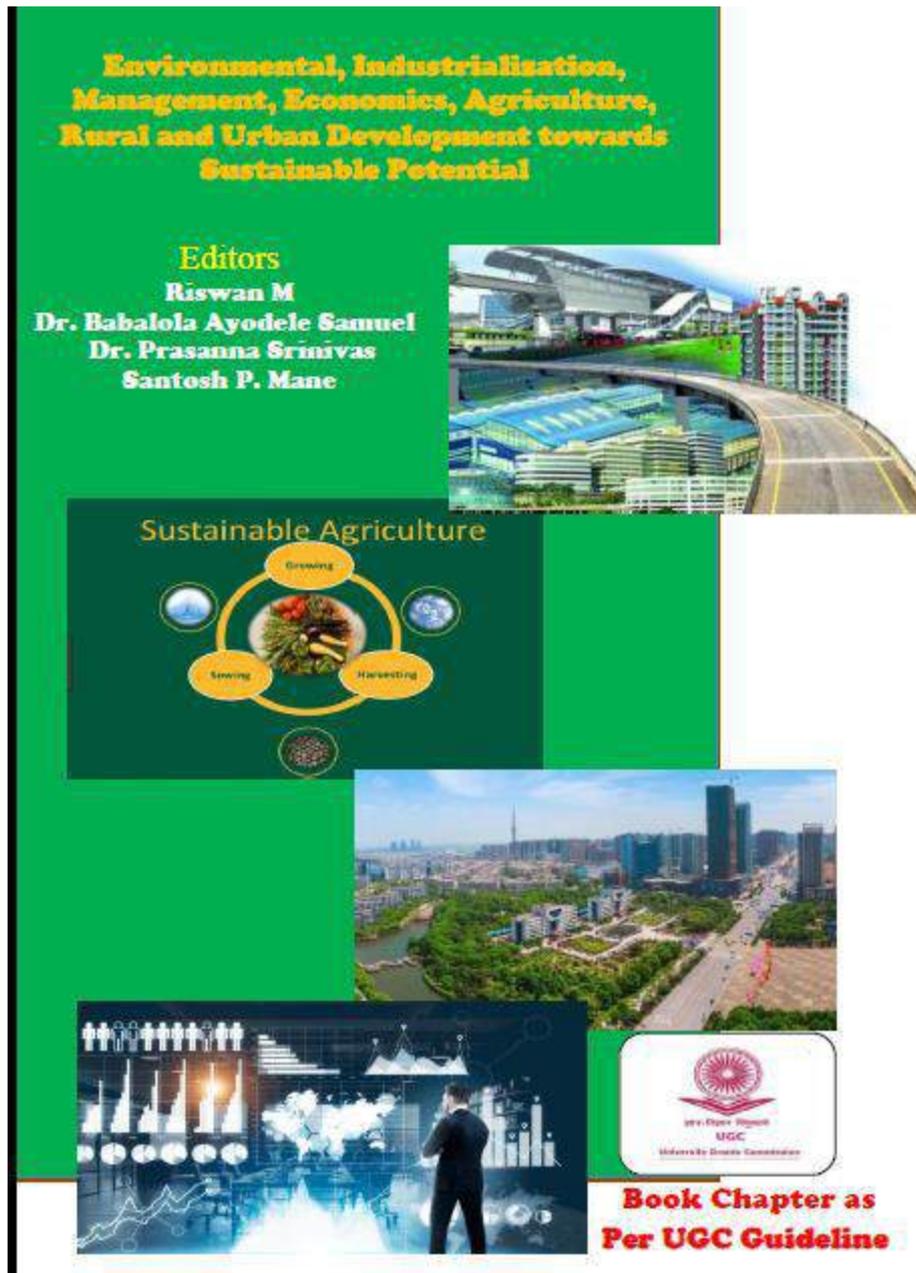


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Optical properties of Cobalt Ferrite Thin Films Prepared by Spray Pyrolysis method

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ABSTRACT

Magnesium doped Cobalt ferrite thin films ($\text{Co}_{1-x}\text{Mg}_x\text{Fe}_2\text{O}_4$ for $0.0 \leq x \leq 1.0$) were grown using spray pyrolysis method. The grown thin films were annealed at 500°C for 4 h and further used for the investigation of these thin films were done and their structural, optical properties are studied. The structural characterizations with the help of the X-ray diffraction pattern of the prepared samples shown the formation of single-phase cubic spinel structure of the films. The band gap of the films was measured by UV-VIS spectrophotometer. It is observed that, the energy band gap decreases from 2.83 eV to 2.37 eV as increase in magnesium substitution. The Photoluminescence study showed the characteristic near-band-edge emission of presently investigated films samples at around 710 nm. The contact angle measurements revealed the hydrophilic nature of all the thin films under investigation.

Keywords: X-ray diffraction, Thin Films, ferrite material, spray pyrolysis, spectrophotometer.

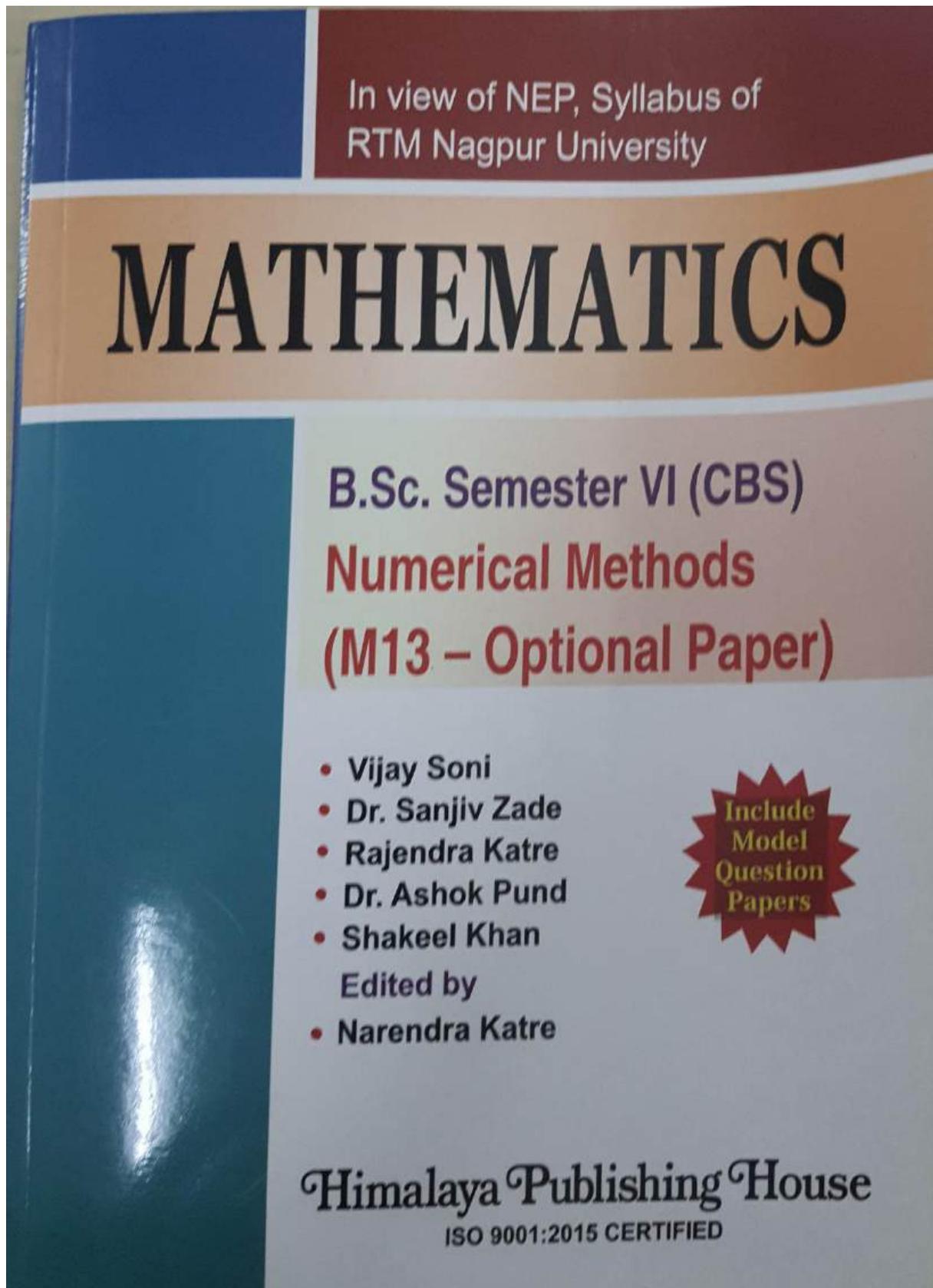
1. INTRODUCTION

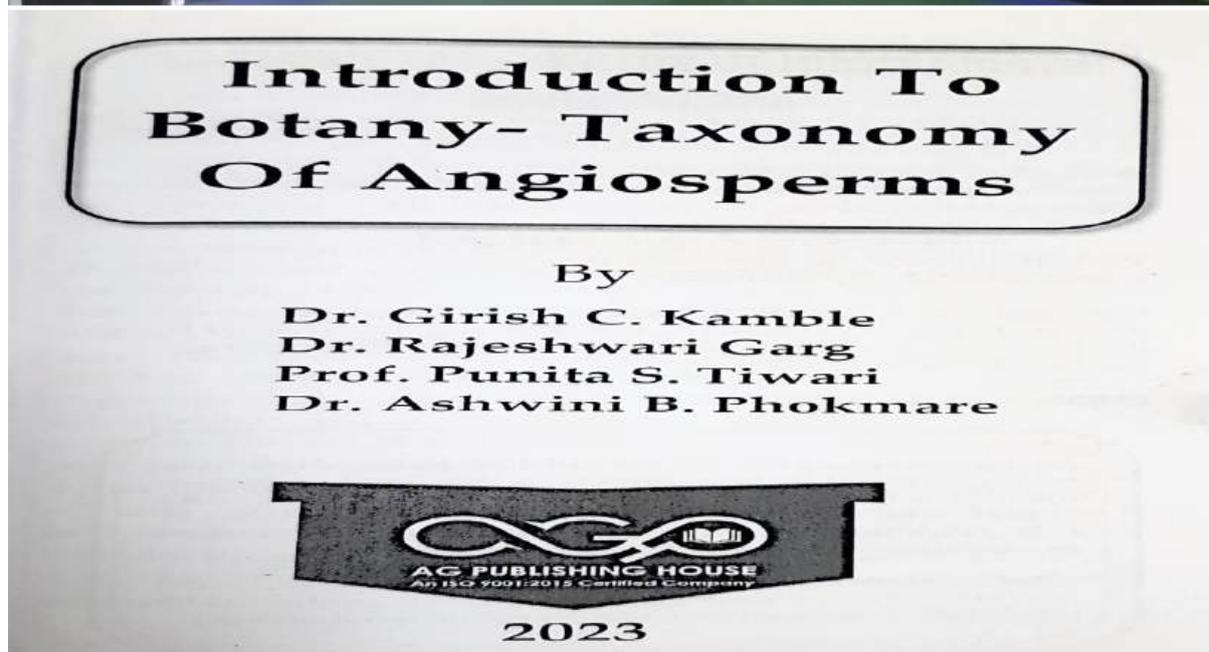
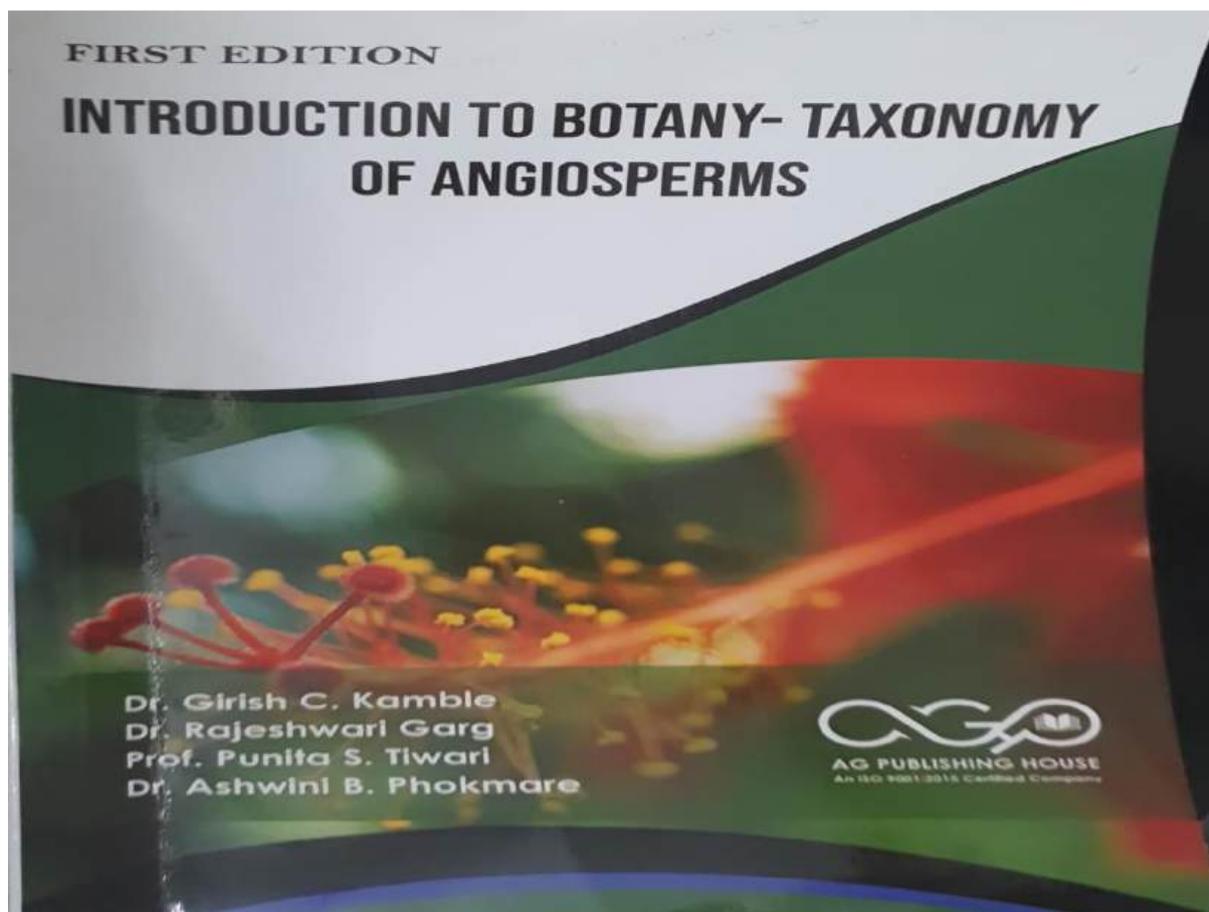
Among all the metal oxides, the ferrites with iron oxide and metal oxide as their main components are of considerable interest to the scientist and technologist owing to their combined electrical and magnetic properties [1]. Ferrites are grouped into three classes namely spinel ferrite, garnets and hexagonal ferrites depending on their crystal structure. Among these types of ferrites, spinel type ferrites are unique class of ferrites having potential applications in various fields [2, 3]. Spinel ferrites with general formula MFe_2O_4 (where M can any of the divalent metallic ions) possess two interstitial sites namely tetrahedral (A) and octahedral [B] site. Spinel ferrite possess the remarkable properties like high electrical resistivity, low eddy current, low dielectric losses, high saturation magnetizations etc. [4]. The important electrical and magnetic properties of spinel ferrites are depends on their composition, distributions of cations over available sites and microstructure, which in turn are sensitive to the preparation techniques and preparative parameters [5]. Because of the remarkable properties, spinel ferrites have the applications in the field of magnetic data storage, gas sensors, high frequency devices etc. Recently, nanosized spinel ferrites have been of much importance from application point of view. The smaller size (nanometer dimension) and high surface to volume ratio of the nanocrystalline spinel ferrite makes them useful in medical, environmental, water purification etc. field [6, 7].

In this research article, Magnesium substituted cobalt ferrite thin films have been deposited and grown onto glass substrates by spray pyrolysis technique with an aim to investigate their optical, photoluminescence, surface wettability properties. The as deposited thin films were annealed at 500°C for 4 h in an ambient atmosphere and further characterized by X-ray diffraction (XRD), UV-VIS spectrophotometer, photoluminescence (PL), contact angle measurements, etc. properties was studied and the results are presented in this work

2. MATERIALS AND METHODS

Magnesium substituted cobalt ferrite thin films with chemical formula $\text{Co}_{1-x}\text{Mg}_x\text{Fe}_2\text{O}_4$ (where $x = 0.0$ to 1.0 , in step of 0.2) were grown on cleaned glass substrates using the low-cost spray pyrolysis method. The basic principle of spray pyrolysis technique is that, when droplets of spray solution through spray gun with moderate pressure reach to the hot substrate, due to the pyrolytic decomposition of





INTRODUCTION TO BOTANY- TAXONOMY OF ANGIOSPERMS

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About The Book

Plant taxonomists seek to learn as much as they can about the earth's plant knowledge and gather them into systematic plants. Due to the vastness of Earth's vegetation, knowledge cannot be gathered without first being organised. To begin, we must take an exhaustive tally of all plant life in a given region and, eventually, the whole planet. The initial step in taxonomy is the gathering and preparation of herbarium specimens for future research. Identification is the next step, and it requires identification descriptions, drawing pictures, and creating keys. Taxonomy's main aim is to accurately identify all plant plants, and its secondary goal is to order them according to a universally agreed categorization system. The process of identification entails deciding whether or not a taxon (plural taxa) is the same as or closely related to a previously known taxon. A plant may only be properly identified if it is placed in the correct taxonomic family, and only then can it be properly classified as a species. This may be done with the aid of floras, monographs, and herbaria, all of which are now in circulation. A plant is considered to be a new species when all attempts to identify it as a member of an existing species have been fruitless. Assembling plants into taxonomic groups based on their shared characteristics is known as classification. The result is a well-thought-out classification system in which any number of species may be placed in any given category. Strongly linked groups are grouped together in accordance with the principles underlying any current system of classification, which are based on their genetic link.

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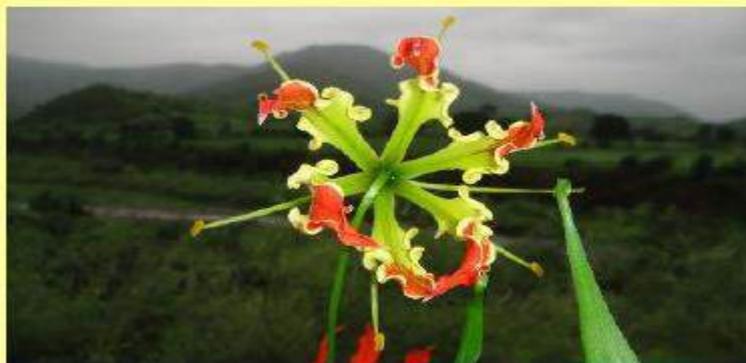
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AN ADVANCE TOOL FOR QUALITATIVE ANALYSIS OF HEAVY METAL IN THIN LAYER CHROMATOGRAPHY

Sarang S. Dhote

Assistant Professor, Department of Chemistry, S.S.E.S. Amravati's Science College,
Nagpur India

ABSTRACT

TLC is the most convenient analytical procedure for the study of the separation of multi-component systems. Here we introduce a simple and quick analytical software that is SS-831(Super-Saragraphy 831) which is useful for qualitative analysis of toxic metal ions from various samples. This software was copyrighted in the year 2018 in India. By using this software research scholars were getting results by simply uploading an image of a developed chromatographic plate in SS-831. The generated report gives information regarding the name of the metal and their R_f values.

Keywords- TLC, SS-831, Heavy Metal, Software, Image, Analytical.

1. INTRODUCTION

Low-cost Thin layer chromatography is found to be a superior analytical method for both qualitative and quantitative analysis. Many chromatographic experiments are carried out at the undergraduate level for the study of separation of components from multi-components systems. Various fundamentals of TLC such as R_f , H-bonding and polarity well explained for the students by the series of simple laboratory experiments¹, separation of pigments from ink², from beverages³, separation of caffeine from beverages⁴ and recent reversed-phase TLC was also explained in⁵. Various developments were carried out in TLC in terms of quantitative analysis, like rTLC⁶ and qTLC⁷.

The main limitation of this TLC is the maximum time required for the analysis and as soon as the number of the sample increases the requirement of time for analysis also increases. Hence rapid qualitative analytical tool is required for the development of TLC in the modern era. Here we present a simple and user-friendly software that makes students qualitatively analyze the components they are studying. This program is developed to work with images of developed chromatograms obtained by simple equipment like a mobile phone. In this article, we carried out a separation of heavy metal ions using silica gel-g adsorbent. While the tool's capabilities are illustrated in this separation analysis, the analytical approach is general and can be extended to a wide variety of other TLC experiments.

2. EXPERIMENTAL PROCEDURE

2.1. Materials:

Ethanol, Acetic acid (99.8%), various salts of some toxic metals were obtained from Loba Chemicals and Silica Gel-G was obtained from Merck India.

2.2. Test Solution:

TLC was performed using a standard aqueous solution (1%) of the chloride, nitrate or sulfate salts of the metal ions.

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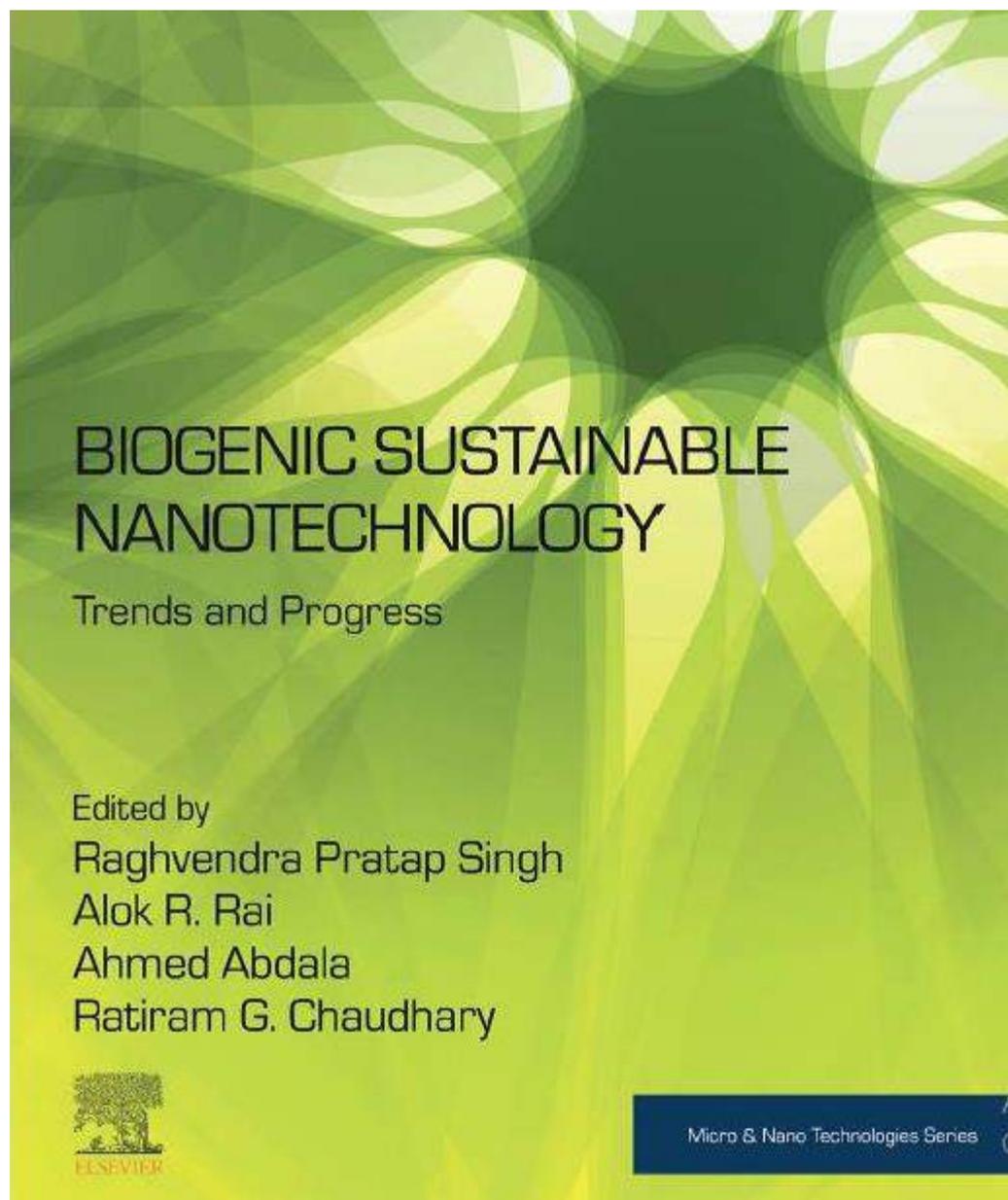
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BIOGENIC SUSTAINABLE NANOTECHNOLOGY

Trends and Progress

Edited by Raghendra Pratap Singh, Alok R. Rai, Ahmed Abdala and Ratiram G. Chaudhary

Biogenic Sustainable Nanotechnology: Trends and Progress focuses on the green synthesis of nanomaterials with various biological systems, emphasizing the mechanisms of nanomaterial synthesis, spectroscopic characterizations, and applications in a variety of industrial sectors.

Interest in developing eco-friendly, green, cost-effective, and facile methods for nanomaterials synthesis is rapidly growing. Green synthesis methods focus on a greener environment, minimizing generated waste, and implementing sustainable processes. As discussed in this book, green nanostructured materials often include phytochemical agent extracts, such as carbohydrates, flavonoids, saponins, proteins, amino acids, chromone, steroids, phytol, and terpenoids. These phytochemicals from plant extracts play a crucial role in improving the reduction rate, size, and stabilization, by acting as good reducers, surfactants, structure directors, and capping agents.

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- Explores how environmentally friendly bionanomaterials are used for a variety of industry sectors
- Assesses the significant challenges of producing environmentally friendly biogenic nanomaterials on an industrial scale

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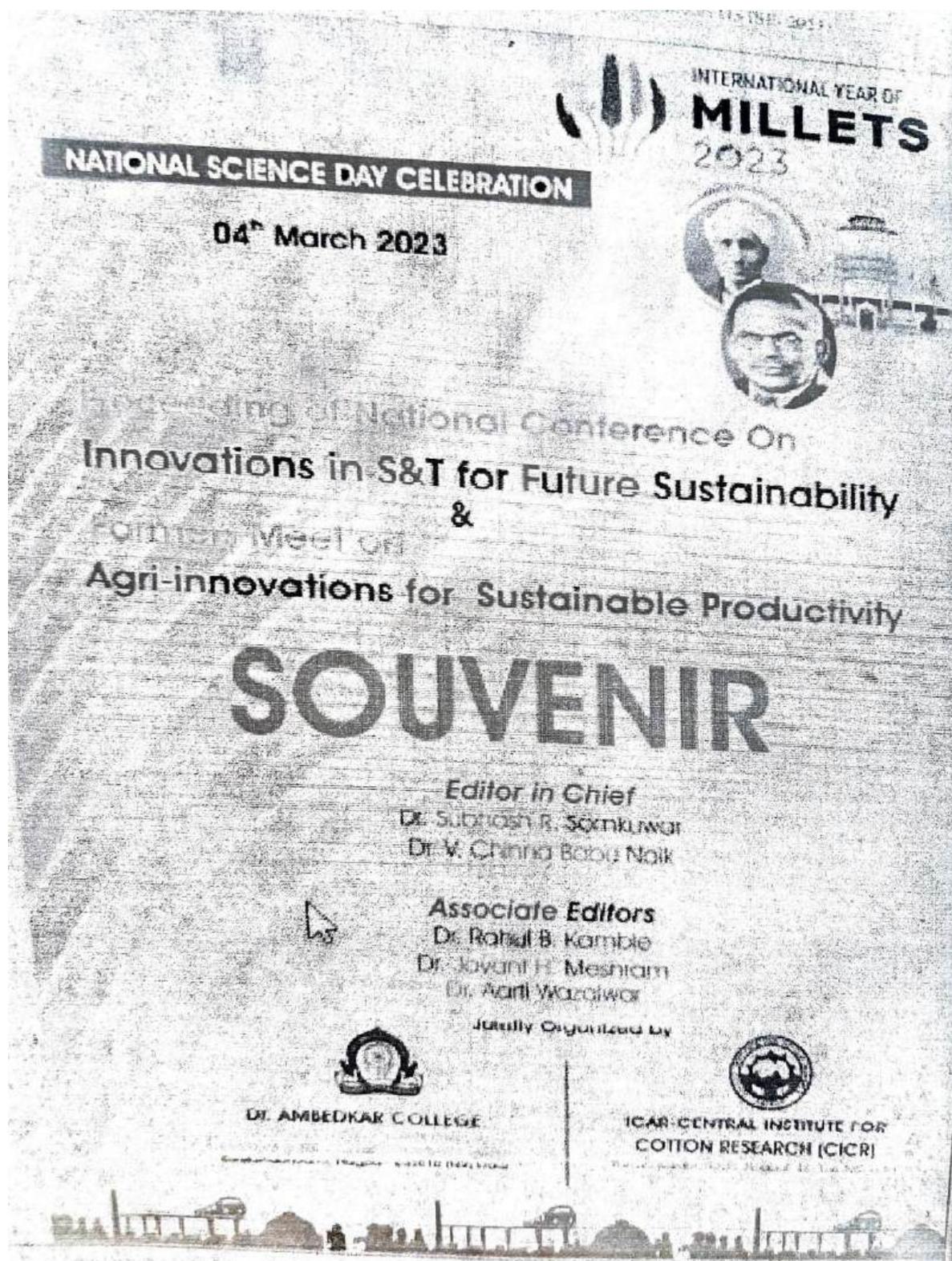


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ROLE OF MILLETS FOR DIABETES MELLITUS MANAGEMENT**Shital S.Deshmukh¹; Chanchal R.Deshmukh²**¹*Science College Pauni**Joints organized by Dr. Ambedkar College, Deekshabhoomi, Nagpur and ICAR Central Institute for Cotton Research (CICR, Nagpur)*

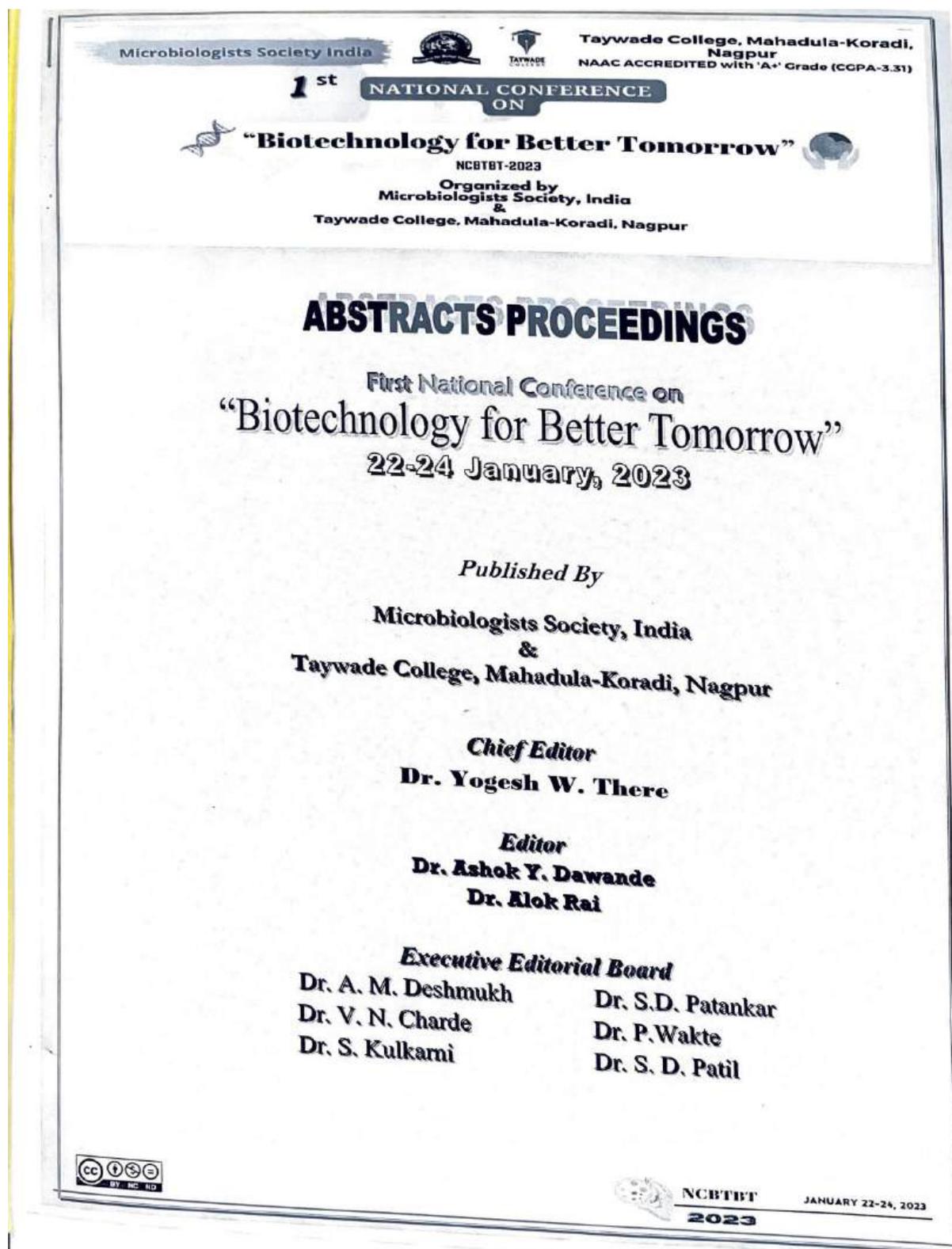
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*Proceeding of National Conference on Innovations in S&T for Future Sustainability (ISTSF- 2023)*²*Taywade College Koradi**drshitaldeshmukh@gmail.com; chanchaldeshmukh@gmail.com***ABSTRACT**

Diet has a significant effect on your blood sugar levels. Figuring out what to eat and avoid when person have diabetes can be a little confusing. It is crucial to understand the effect of every food and drink that person consume on his blood sugar levels if the person has diabetes. The main goal of the diabetes diet should be maintaining healthy blood sugar levels. There are several foods that are known to regulate blood sugar levels. Millet is a whole grain. It is considered a good carb, so it's easily digestible. And since it is also gluten-free, it is a great alternative for people living with celiac disease or gluten sensitivity. Millet is lower on the glycemic index (GI) than many other grains. Additionally, millet has a high nutritional value. That means it raises blood sugar slowly and gradually instead of in quick spikes. High-fiber, low-GI foods keep blood sugar steady, lower cholesterol, and help weight loss. All of these things are helpful for people with diabetes. Fiber and good carbs are also found in it and it takes time to digest due to the presence of insoluble fiber. So, the sugar level in the blood does not increase instantly. Diabetes patients must include millet in the diet to control sugar. For this, a person can eat millet bread, millet khichdi in breakfast, in lunch or in a dinner. As a result, sugar enters the bloodstream slowly, lessening the risk of a blood sugar spike. People living with diabetes also need to be familiar with the glycemic index and know the GI value of the foods they eat. The key to blood sugar management is eating a healthy diet. This doesn't only apply to people living with diabetes, but to everyone.

Keywords: Millets, diabetes mellitus, glycemic index







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Abstract

Leeches (Hirudinea) constitute a relatively small monophyletic group of highly specialized annelids and play important roles as invertebrate predators in freshwater, while others are infamous for their ectoparasitic bloodsucking. They are globally distributed on all continents with one-half of all continental species, known for their local endemism. Leeches are hermaphroditic annelids with totally reduced chetae and parapodia which are dominant in other classes of Phylum. Leeches have unpaired male and female genital pores in the region of clitellum which is glandular region in the body of leech. Leech has anterior and posterior sucker from which the anterior sucker is used for attachment and useful in blood sucking while the posterior sucker is only for the attachment to host body. The body of leech is annulated in appearance, each annulus or somite is superficially divided into usually three to five sub annuli or segments sometimes these annuli may reach to ten in number. Most of the leeches are sanguivorous on vertebrates or invertebrates others are predatory mainly and very few are scavengers in their mode of feeding. Following species collected from Semadoh region of Melghat. *Herpobdelloidea lateroculata*, *Hirudo (Asiaticobdella) Birmanica*, *Poecilobdella manillensis*, *Poecilobdella granulosa*, *Poecilobdella viridis*, *Placobdella emydae*. It has been seen that due to vegetation and temperature, number of wetland leech species and population density of them varies.

Keyword: *Leeches, Diversity, Species, Distribution*



Cloud Cryptography: Countering data protection and data security in cloud

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Abstract: Cloud computing has become the ideal way to deliver enterprise applications and the preferred solution for companies extending their infrastructure or launching new innovations. Data security is the most important aspects in cloud platform. Many researchers have addressed this issue by Cryptography with different encryption schemes that provides secure data sharing without delaying data transmission on cloud. Modern cryptography concerns itself with Confidentiality, Integrity, Non-repudiation and Authentication. Ensured cloud data protection is an important part of the cloud computing environment because customers often store sensitive information with cloud storage services but they are not secure services. So it remains a challenge to exchange data in a safe way while storing data from an unconfident cloud. This paper addresses the fundamentals of cloud cryptography that is the encryption of data stored in the cloud which adds a strong layer of protection and avoids a data breach, hacked or malware. The paper concludes by urging further study into the proposed cryptography algorithms to keep a balance between security and efficiency to reduce cybercrimes.

Keywords: Cryptography, cloud computing, encryption, decryption, data security, data transmission, cybercrimes

Introduction:

Cloud computing is the delivery of computing services including servers, storage, databases, networking, software, analytics, and intelligence over the Internet ("the cloud") to offer faster innovation, flexible resources, and economies of scale. Most cloud computing services fall into four broad categories: infrastructure as a service (IaaS), platform as a service (PaaS), server less and software as a service (SaaS). These are sometimes called the cloud

Data ends up being stolen; cybercriminals fail to read the content of the encrypted files. Many experts regard encryption as a successful and effective approach to robust data security [1].

Countering data protection and data security in cloud by cryptography

Your data should always be protected, which means

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Section IV : Chemical Science

PP: 194. 1,2,3-TRIAZOLE TETHERED AURONE ANALOGS AS POTENT ANTI-PROLIFERATIVE AGENTS

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... i.e. 2-benzylidenebenzofuran-3(2H)-one is a ubiquitous family of compounds having benzofuranone heterocyclic ring connected to phenyl group via a carbon-carbon exocyclic double bond. These fascinating compounds are secondary plant metabolites and are liable for imparting coloration in flowers, fruits and other coloured portions of the plants. Aurone and its derivatives constitute an important class of biologically active heterocyclic compounds which have added new dimensions to drug development. As a result of these interpretations and to satiate our research interest on molecular-hybridization based multi-component approaches, we have designed and synthesized a library of some novel 1,2,3-triazole tethered aurone analogs with an aim to develop new drug molecules with promising biological activity.

PP: 195. SCOPE OF NON-LINEARITY'S AND THERMODYNAMIC STABILITY FOR STATIONARY SPATIAL STRUCTURES

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Thermodynamic stability of oscillatory chemical system using Lypunov analysis has been investigated in this paper. Far from thermodynamic equilibrium, the competition between homogenization of chemical components by free diffusion and spatial localization due to local disturbances of chemical processes lead to the appearance of stable nonuniform distributions of matter. The spatial structures are sustainable if the time scales of the chemical change much shorter than that of the

Role of cryptography in cyber security

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Abstract:

The current world is run by technology and network connections, it is crucial to know what cyber security is and how effectively it is used in real life scenario. Cryptography is one of the oldest and most widely used tool for safeguarding IT assets. Cyber attacks are increasing day by day, prevention of data from getting theft is the today's need. Cyber security is one of the remedies to alleviate cybercrimes [1]. It's subset is cryptography which support and provides powerful design algorithms, ciphers and security measures, that usually involved codify and keep company and customer data protected. Basically the aims is to reduce the risk of cyber attacks and protect against the unauthorized exploitation of systems, networks and technologies. Modern cryptographic techniques significantly incorporate and contribute towards today's accelerated cyber security needs. This literature includes types of cyber attacks, cryptography attacks and its preventive measures. Finally it is concluded that if organizations deploy cryptography as one of the means of cyber security, the systems will be more secure[10].

Keywords: Cyber attacks, cyber security, cryptography, cybercrime, Threats

1) Introduction

With the growth in internet users, the growth in cyber-crimes can also be seen. Cyber-crime can be done primarily by utilizing the technique of hacking. Hacking is the method in which the criminals get access to the victim's system without their knowledge. All the persons who use internet and especially those make money transactions through internet be careful with the cyber criminals. [7]Cryptography is essential to many models of cyber security. Cryptography applies algorithms to shuffle the bits that represent data in such a way that only authorized users can unshuffle them to obtain the original data. Cryptographic algorithms use mathematics to achieve effective shuffling.

The Cryptography is an art of hiding data or information from unauthorized users. This paper focuses on Blowfish symmetric encryption. Blowfish supports secure user authentication for remote access and used by many popular products that discussed in this paper.

2) Cryptography attacks

A cryptographic attack is a method used by hackers to target cryptographic solutions like ciphertext, encryption keys, etc. These attacks aim to retrieve the plaintext from the ciphertext or decode the encrypted data. Hackers may attempt to bypass the security of a cryptographic system by discovering weaknesses and flaws in cryptography techniques, cryptographic protocol, encryption algorithms, or key management strategy[8].

Passive attacks:

Passive cryptography attacks intend to obtain unauthorized access to sensitive data or information by intercepting or eavesdropping on general communication. In this situation, the data and the communication remain intact and are not tampered with. The attacker only gains access to the data[15].

Active attacks: On the other hand, active cryptography attacks involve some kind of modification of the data or communication. In this case, the attacker not only gains access to the data but also tampers with it.

shoots were able to produce 100% roots in tested IBA concentrations. Among all selected rice 1.5mg/l 4, 4-D+0.1 mg/l BAP is most successful for callus induction while 2.0 mg/l BAP+0.1 mg/l IAA and 0.5mg/l NAA most effective for shoot regeneration and 2.0 mg/l IBA for root induction respectively.

Keywords: Drought tolerance, *Oryza Sativa*, in *–vitro* selection, callus induction, abiotic stress

Study of Sewage Water Produced By Hospital in Sewage Treatment Plant

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ABSTRACT

Sampling of inlet and outlet of Sewage treatment plant from Matru Seva Sangh hospital, Mahal, NAGPUR Waste water treatment is a process used to remove contaminants from waste water or sewage

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and convert it into an effluent that can be returned to the water cycle with acceptable impact on the environment, or reused for various purposes (called water reclamation). Pollutants in wastewater are removed, converted or broken down during the treatment process. Its objective is to produce an environmentally-safe fluid waste stream (or treated effluent) and a solid waste (or treated sludge) suitable for disposal or reuse (usually as farm fertilizer). The samplings of the sewage waste from hospitals have been done in Different times of the day to have an average data of the measured Parameters. The average values of pH, Turbidity, Acidity, Chloride, Residual Chlorine, Hardness, Total Solid, BOD, COD, DO, Alkalinity, Total Iron Content, Total dissolved solid, Total coliform, Faecal coliform, Zinc Content, Potassium, Copper, Magnesium, Nickel, Chromium, Lead, Calcium, Aluminum and Silicon are found out. From above observation and results we concluded that the STP of Matru Seva Sangh hospital works properly all parameter results under standard range, so we will use this treated water for gardening, agriculture, cleaning of surface

Key words: Waste water, B.O.D , Primary treatment

A Review Article: Environmental Impact of Air Pollution Management Policies



DEEP LEARNING POWERED FIREWALL ANOMALY MANAGEMENT ENVIRONMENT USING CONVOLUTION AND RECURRENT NEURAL NETWORK

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ABSTRACT:

A firewall is a technology that connects a network to one or more external networks by acting as the network's interface. It is responsible for implementing the network's security policy by deciding which packets should be permitted to travel across the network based on criteria set by the network administrator. Any error in the formulation of the rules may result in the security of the system being compromised, as unwanted traffic may be allowed to pass through while appropriate traffic is prevented from passing through. An anomaly in policy may result from manual rule formation because it produces a collection of regulations that conflicts with itself, redundant with itself, or overwhelmed with itself, which is a result of the manual defining of rules. Manual identification and resolution of these anomalies is necessary, but it is a time-consuming and error-prone task that must be done by hand. Previous research on abnormalities in firewall policy has mostly focused on the analysis and identification of these anomalies, with little attention paid to the causes of these anomalies. Previous works describe the potential relationships between rules, as well as the anomalies that may occur as a result of the relationships, and they provide methods for identifying the anomalies through the analysis of the rules in question.

In this research, we present a method for identifying the anomalies through the analysis of the rules in question separately by Convolution Neural Network and Recurrent Neural Network.

Keywords :- Firewall, Neural Network, CNN models, Internet Network.

INTRODUCTION :

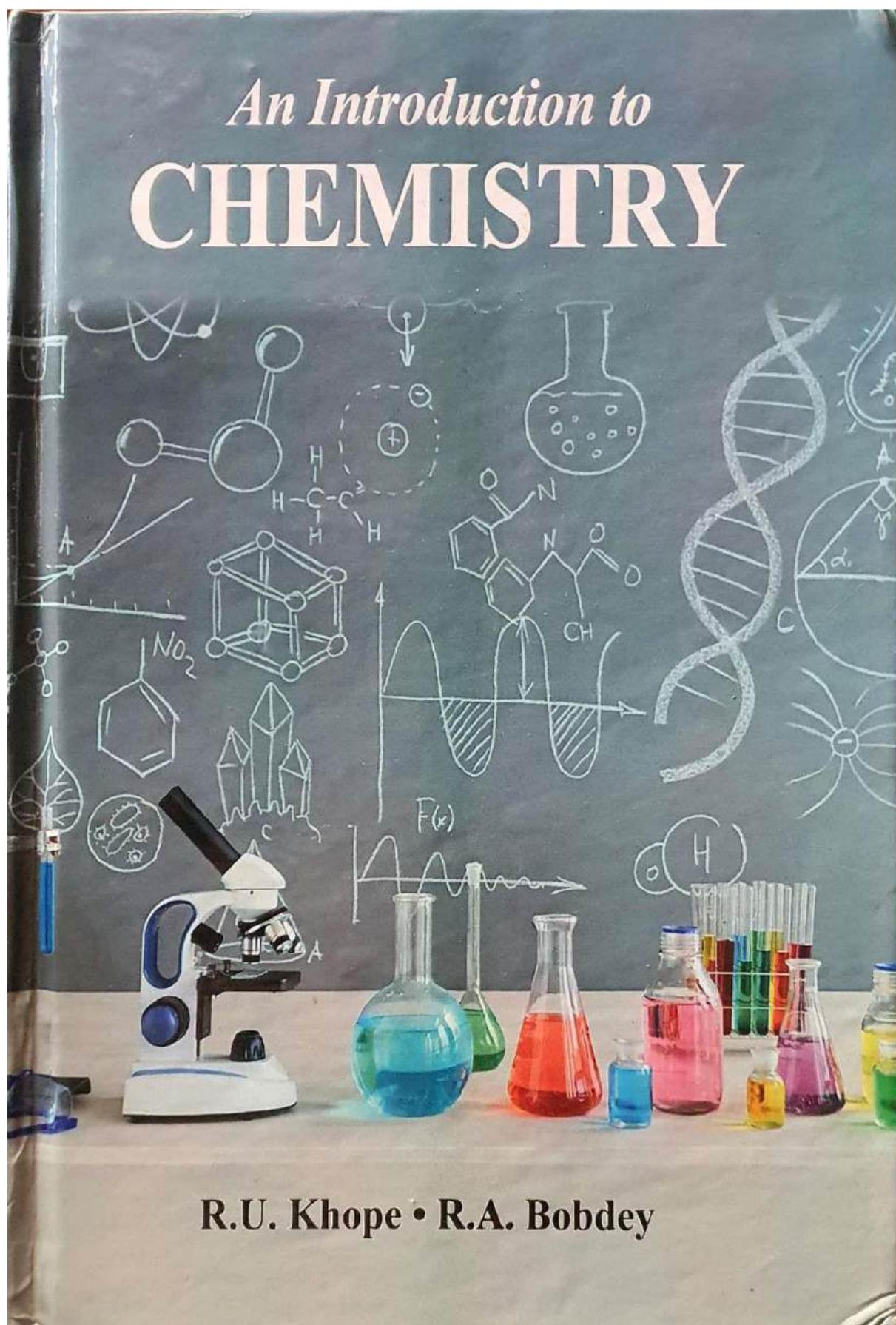
A firewall's job is to examine packets and decide whether they should be accepted or rejected based on a set of rules. These rules are frequently in opposition, resulting in oddities. Maintaining firewall rules is a bit of a challenge. Any firewall's performance is measured by the characteristics of its policy configuration and rule set. The algorithm implemented in a tool which identifies the anomalies automatically in rule set by placing the new rule in its appropriate position.

Any network's security protocol is enforced via a firewall, which may filter out undesirable traffic. A set of rules that have been created based on predetermined security policy requirements and are used to make filtering decisions. Firewall policies promotes the effective service of firewalls. Rule-based segmentation for firewall

policy anomaly identification and Optimizing rule order which not only identify and remove Firewall Policy Anomalies but also reduces Packet-Rule searching time to improve system performance. The Heuristic Approximation Algorithm is used to Optimize Rule list. The following are the objectives of the paper

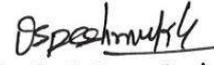
1. To study Firewall Technology and its application in Traffic management and Internet Intrusion Detection
2. To develop the Convolution Neural Network Powered Firewall Anomaly Management Environment with unique architecture implementation on Local and Internet Network.
3. To develop the Recurrent Neural Network Powered Firewall Anomaly Management Environment with unique architecture implementation on Local and Internet Network.







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