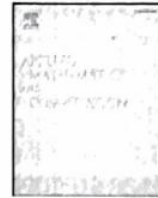


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Characterization of general position sets and its applications to cographs and bipartite graphs

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ABSTRACT

A vertex subset S of a graph G is a general position set of G if no vertex of S lies on a geodesic between two other vertices of S . The cardinality of a largest general position set of G is the general position number $gp(G)$ of G . It is proved that $S \subseteq V(G)$ is in general position if and only if the components of $G[S]$ are complete subgraphs, the vertices of which form an in-transitive, distance-constant partition of S . If $\text{diam}(G) = 2$, then $gp(G)$ is the maximum of $\omega(G)$ and the maximum order of an induced complete multipartite subgraph of the complement of G . As a consequence, $gp(G)$ of a cograph G can be determined in polynomial time. If G is bipartite, then $gp(G) \leq \alpha(G)$ with equality if $\text{diam}(G) \in \{2, 3\}$. A formula for the general position number of the complement of an arbitrary bipartite graph is deduced and simplified for the complements of trees, of grids, and of hypercubes.

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1. Introduction

Motivated by the century old Dudeney's no-three-in-line problem [6] (see [11,14,17] for recent developments on it) and by the general position subset selection problem [7,16] from discrete geometry, the natural related problem was introduced to graph theory in [12] as follows. Let $G = (V(G), E(G))$ be a graph. Then we wish to find a largest set of vertices $S \subseteq V(G)$, called a *gp-set* of G , such that no vertex of S lies on a geodesic (in G) between two other vertices of S . The *general position number* (*gp-number* for short), $gp(G)$, of G is the number of vertices in a *gp-set* of G .

As it happens, the same concept has already been studied two years earlier in [20] under the name *geodetic irredundant sets*. The concept was formally defined in a different, more technical language, see the preliminaries below. In [20] graphs G with $gp(G) \in \{2, n(G) - 1, n(G)\}$ were characterized and several additional results about the general position number were deduced. The term general position problem was coined in [12], where different general upper and lower bounds on the *gp-number* are proved. In the same paper it is demonstrated that in a block graph the set of simplicial vertices forms a *gp-set*.

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Boundary Vertices of Cartesian Product of Directed Graphs

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Mary Shalet Thottungal Joseph² · Ram Kumar³

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Abstract

Suppose that $D = (V, E)$ is a strongly connected digraph. Let $u, v \in V(D)$. The maximum distance $md(u, v)$ defined as $md(u, v) = \max\{\vec{d}(u, v), \vec{d}(v, u)\}$ is a metric, where $\vec{d}(u, v)$ denote the length of a shortest directed $u - v$ path in D . The boundary, contour, eccentricity and periphery sets of a strong digraph D are defined with respect to this metric. The main aim of this paper is to identify the above said metrically defined sets of a strong digraph D in terms of its prime factor decomposition with respect to Cartesian product.

Keywords Maximum distance · Boundary · Contour · Eccentricity · Periphery · Two sided eccentricity property

Mathematics Subject Classification 05C20

Introduction

In the present scenario, one-way networks are frequently met across in all areas of day to day life. One-way networks can be represented as directed graphs whereas two-way networks as undirected graphs. But dealing with one-way networks is much more difficult than two-way networks. As an instance, finding the distance between pairs of vertices in a one-way network involves twice the number of steps involved in a two-way network with the same number of vertices. Hence in complicated one-way networks, the idea of prime factor decomposition have important applications.

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Synthesis, crystal structure and dielectric properties of a new acetate bridged coordination polymer: {[La(μ -CH₃COO)(PDC)(H₂O)₂].2H₂O}_n

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Highlights

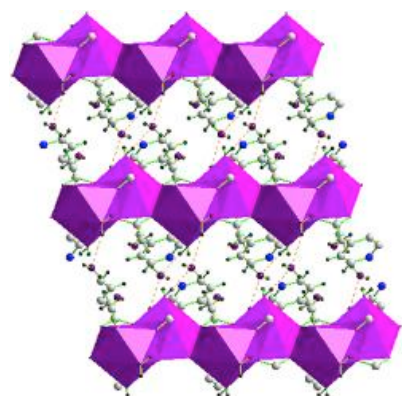
- An acetate bridged 1D coordination polymer of La(III) with pyridine-3,4-dicarboxylic acid has been prepared
- Metal centre is nine coordinated to form distorted tri-capped trigonal prism geometry
- 2D supramolecular sheets are formed by hydrogen bonding interaction.

Abstract

An acetate bridged coordination polymer of lanthanum, formulated as {[La(μ -CH₃COO)(PDC)(H₂O)₂].2H₂O}_n (H₂PDC = pyridine-3,4-dicarboxylic acid) has been successfully grown by single gel diffusion technique at room temperature using hydrosilica gel and further characterized by elemental analysis, powder X-ray diffraction, FT-IR and UV-visible spectral studies. The compound crystallizes in triclinic space group, *P*1. The metal centre is nine coordinated by oxygen atoms to form distorted tri-capped trigonal prism geometry. Single crystal X-ray diffraction studies reveal that the compound exists as one dimensional polymeric chain which is further assembled into 2D supramolecular framework via extensive hydrogen bonding. The dielectric and thermal decomposition behaviour of the sample was also studied.

Graphical abstract

Packing diagram of title compound in polyhedral design viewed along 'b' axis.



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Introduction

Coordination polymers (CPs) are an important class of inorganic-organic hybrid materials with well regulated network structures displaying a wide variety of potential applications in the field of catalysis, gas adsorption/separation, nonlinear optics, magnetic materials and so on [[1], [2], [3], [4], [5]]. CPs can be self-assembled by the coordination of metal ions/clusters with rigid organic entities to form stable architecture with attractive structural topologies. In this regard, considerable efforts have been devoted to design and control the self-assembly of the coordination networks by judicious choosing of unsymmetrical ligands having two or more coordination sites with differing donor ability, thereby resulting in unprecedented structures with aesthetic architecture [6,7]. Nanoporous CPs with optimal pore system and physical properties can be obtained by optimizing the position of alkyl groups in the channels which will enhance the performance of adsorption and separation ability of these materials for gas purification [8,9]. However, increasing the molecular size and complexity of ligands will induce interpenetration of coordination networks and reduces the pore volume. Thus, designing the porous CPs employing small low-symmetry ligands in combination with metal clusters represents a promising strategy to preserve high surface area and porosity with dense open metal sites [10]. In addition to the structural diversity of organic linker, the coordination geometry of metal ions, pH of the reaction medium, temperature and the presence of counter ions also influences the self assembly process. Recently, mixed ligand strategy has been employed for fabricating CPs with exceptional properties and structural flexibility [11]. However, designing and controlling the assembly of porous CPs to fulfil the application in feasible condition still

KERALA BANK – AN INNOVATIVE MERGER STRATEGY OF CO-OPERATIVE BANKS

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ABSTRACT

Merging is the process of conjoining two or more entities operate in the same sector and seam to form a new business entity. Merger enhances the productivity of an enterprise. It helps to form the effect of synergy. We are heard the proverb Union is strength. We can do more things and generate more ideas if it is do it in jointly, that is the advantage of merger also. A merged organisation can take over the advantages of two or more entities. Banking services are essential for the development of a nation. Public sector banks, privet sector banks, foreign banks, and co-operative banks are the major banking institutions that provide financial assistance to trade and developmental activities. As compared with other banking institutions co-operative banks mainly concentrated to provide financial assistance to rural areas and they are poor in technological advancement. They did not use any modern banking facilities like ATM, NET Banking, RTGS system, E-banking, Mobile banking etc. This is the major drawback of co-operative banks. In order to overcome this disadvantage the Reserve Bank of India and Government of Kerala decided to merge 14 co-operative banks with state co-operative bank. It is named as Kerala Bank. It overcomes all the limitations of a co-operative bank and it must provide all technical advancement to people. The paper aimed to describe about Kerala bank also highlight the advantages of merging.

Keywords: Merger, Co-Operative Bank, Kerala Bank

INTRODUCTION

Merger is the process of unification of two or more business houses to form an entirely new entity. It leads to the dissolution of two or more entities and form a new entity. The merger strategy is mainly adopted by companies to maximise their growth by expanding its production and marketing operations. This process leads to creation of synergy. It helps to create customer base, reduced competition, and birth of a new product segment or new market in the economy. It is a form of amalgamation. The assets and liabilities of the companies undergoing amalgamation convert the assets and liabilities of the amalgamated company. Likewise the shareholders of the old company become the owners of new company. The major reasons behind the merger is to achieve the sustainable development, increase the scale of operation, maintain a satisfactory and balanced growth, elimination of competition, reduce cost and getting efficient human resources. Now the co-operative bank decided to merge for getting these benefits.

Co-operative banks constitute an important segment of the banking system. They have an intensive bank network and they mainly provide financial assistance to the people in the rural area. They mainly target the lower and middle income group and strengthening the rural credit distribution system. Co-operative banks are operated on the basis of principle of co-operation and they are not profit motive, the main motto of co-operative bank is rendering service to the society.



QUALITY OF WORK LIFE PRACTICE IN MULTINATIONAL COMPANIES WITH SPECIAL REFERENCE TO COCA-COLA COMPANY

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INTRODUCTION

The term Quality of Work Life was first propounded by Louis Davis on 1970's to describe the workers level of satisfaction. As the workers spend around twelve hours daily in the work place the importance as well as widening the scope of Quality of work life was needed. Later in the mid-1990's as the employee's educational level and the rising concern for career and personal life has increased, QWL was considered not only to enhance bottom-line productivity, but also to increase employee's identification and a sense of belonging and pride in their work. Quality of work life involves job security, good working environment, adequate and fair compensation, good employer-employee relation, reduced stress level, career growth, safe working condition etc. It is believed that only a satisfied employee can contribute to the growth of the organisation.

Coco-Cola is an American corporation and manufacturer, retailer and marketer of non-alcoholic beverage. It employees around 62600 employees and is ranked 6th among its top competitors . This shows that the company adopt various strategies to retain existing employees and attract new employee's. Being a multinational company it faces various problems and threats and still it exists due to the dedication and devotion of its employees. The work place safety, worker's health concern, human rights etc. makes it a world-wide leader. The Company have incorporated four principles into its management style- (1). Provide quality in the work place (2). Enrich the work place (3). Preserve the environment and (4). Strengthen the community. Coco-Cola adopts Democratic style as its management style.(Ouppara & Sy, 2012a)

REVIEW OF LITERATURE

In the 1970s, Walton (1975) argues that QWL is a term that represents environmental and human principles, but that were suspended because of the technological evolution and economic development. The author believed that industrial society neglects these principles, focusing on technological and economic developments.

RUCHI (2008) refers QWL to a sum total of values which consist of both the material and non-material, attained by a worker throughout his career life. It includes aspects of work-related life which will bring about satisfaction of the workers such as wages and hours, work environment, benefits and services, career prospects, and human relations.

REDDY & REDDY (2010) reviews the meaning of QWL, analyses the dimensions and practices of QWL and techniques for improving QWL in an organization. The practices followed in the organization are the Walton (1973) eight practices of QWL- adequate and fair compensation, safe and healthy working environment, immediate opportunity for use and development of human capacities and constitutionalism in the work organization. The techniques for improving QWL includes job redesign, career development, autonomous work group, flexible work schedule, participative management, job security and administrative justice.

INTERNATIONAL TRADE: ISSUES AND CHALLENGES

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ABSTRACT

International trade and international retailing which represents the sale and trade of goods, services and capital across international borders are nowadays beset with unique set of challenges. Customers are certainly the beneficiaries of such trend who get opportunities to purchase a wider selection of goods and services whether it is food, clothes, machinery, oil, commodities, etc. The World Trade Organization (WTO) is the only global international organization dealing with the rules of trade between nations whose goal is to ensure smooth and free trade. There are, of course, a huge number of issues with which the WTO could contend. However, the WTO has established a few top priorities for the critical or high-frequency issues. The objective of this study is to highlight these current issues in International Trade & International Retailing.

KEY WORDS: International, Trade, WTO, Globalization, Nations, Issues

INTRODUCTION

The history of international trade can be traced back more than 2,000 years ago connecting Asian markets to the Mediterranean Sea known as silk routes. The international trade is more expensive than domestic trade but the profits that can be generated by attracting customers in foreign markets is highly desirable and often worth the risk of increased transportation and distribution costs. International trade involves exports and imports. Exports are products sold to the global market, while imports are products purchased and brought into a country through international trade. International trade can become complicated when the trade tariffs are increased by countries to make the price of imports less attractive to customers in that country where things are imported. Trade restrictions can also be imposed by a government or the international community against a nation that is encouraging and promoting terrorism, human trafficking or conducting research on weapons of mass destruction. Thus, international trade is often a political tool as well as an economic indication of a country's global presence.

CURRENT ISSUES IN INTERNATIONAL TRADE & INTERNATIONAL RETAILING

DUMPING

Dumping is when a foreign trade partner floods a domestic market with goods that are being sold well below the prevailing price in the domestic market. Dumping is a main concern for the WTO because it disrupts international retailers by artificially manipulating the prices of goods. But dumping can put domestic retailers at a significant risk because they can't offer a competitive price. This becomes further imbalanced because, in many cases, because the foreign partner is able to produce the good so inexpensively as they are not subject to the environmental, labour, or regulatory rules that prevail in the domestic marketplace.

Dumping leads to the erosion and in some cases the disappearance of industries in markets where dumping is occurring because of the relative competitiveness of those industries, ie, less efficient firms to prevail over more efficient firms in international competition. Competitive outcomes are determined by market distortions that are, the factors that make dumping possible, rather than relative competitiveness of individual producers.



INNOVATIVE PRACTICES IN INDIAN BANKING SECTOR: A CRITICAL INVESTIGATION

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Abstract

Government of India's Liberalization, Privatization and Globalization Policy (LPG policy) in 1991 was the ever memorable and most advantageous financial reform in the history of India. After this move, several innovative practices have taken place in the field of Indian banking sector and this policy transformed the traditional Indian banking outlook into a new high-tech global manner. The main objectives of the present study is to understand the technological innovative practices of Indian banking sector. Furthermore, study also concentrated innovative economic development schemes and practices adopted by Government of India through Indian Banking Sector with the support of RBI. Study noted that there is a direct relationship between developments of banking system and overall economic developed of the nation. Concisely, the real mirror image of one another.

Keywords: Innovative practices, Indian banking sector, Electronic Banking (E-Banking).

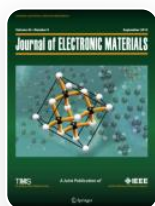
INTRODUCTION

Financial well-being and prosperity of a Nation always depends on efficacy and sustainability of its banking system. When compared to any other developing nations in the world, India having its own eminent historic background and robust culture in its banking system. Since first decade of 18th century, India started their banking system in a well-organised and formal manner. Till 1990s banks are followed traditional method of banking over branch banking. Branch banking encourages monopolistic tendencies in the banking system, customers felt un-easiness and lack of promptness in service delivery. Government as well as Reserve Bank of India (RBI) introduced several schemes, policies and Regulations for the smooth functioning of banks in India; of which, India's New Economic Policy (NEP) in 1991 was the ever memorable and most advantageous financial reform in the history of India. This policy also known as Liberalization, Privatization and Globalization Policy/ LPG policy of Government of India. After this move, various notable developments have taken place in the field of Indian banking sector and this policy transformed the traditional Indian banking outlook into a new high-tech global manner. Through this policy, India's banking industry opening up its traditional door for the gigantic entry of modern foreign banks and international standards of prudential regulations. This paved the way for higher productivity and efficiency in all the sectors of the economy. This move also encouraged the Indian banks for enter into global competition. Banks were started to adopt new technologies in their battle field to tackle and defeat the movement of competitors'. One of major technological innovative practice in the history of the Indian banking sector was introduction of Electronic Banking (E-Banking) in the year 1993. In addition to technological innovative practices, for the perpetual survival of their business, bank also concerned about their major internal factors such as employees and customers which are directly influence their business. Banks started to give more importance to their employees and treated them as precious gem of business. Likewise, banks started to give great consideration for their customers and treated them as 'king'. For the proper retention of good employees and customers, banks adopted variety of innovative techniques in their HRM practices and CRM Practices. Hence, the present study tries to explore various technological innovative practices in Indian banking sector Furthermore, study also pointed out innovative economic

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Structural, Optical and Dielectric Properties of Aluminoborosilicate Glasses



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Volume 49, pages 695–704, (2020) [Cite this article](#)**Journal of Electronic Materials**[Aims and scope](#)[Submit manuscript](#)**M. S. Salinigopal, N. Gopakumar, P. S. Anjana  & B. SureshKumar** **230** Accesses  **15** Citations [Explore all metrics](#) →

Abstract

Glass samples with composition $50\text{AO}-5\text{Al}_2\text{O}_3-30\text{B}_2\text{O}_3-15\text{SiO}_2$ ($\text{A} = \text{Ba}, \text{Sr}, \text{Ca}, \text{Zn}$) have been synthesized by conventional melt quenching technique. The amorphous nature of glasses has been confirmed from the x-ray diffraction patterns. The structural behavior of the glasses investigated using Fourier

transform infrared spectra show a number of absorption peaks due to the bending of Si–O–B linkages, stretching vibrations of Si–O–Si and B–O–B in SiO_4 and BO_4 structural units, respectively. The Fourier Transform Raman spectra of all glasses exhibit different spectral bands and intensities of all bands change with the doping of cations (Ba^{2+} , Sr^{2+} , Ca^{2+} and Zn^{2+}). The optical properties studied using UV–visible absorption spectra, give Urbach energy values in the range 0.51–0.59 eV. The microhardness of the glass samples measured by indentation technique shows a higher value for all glasses (7.68–9.25) GPa, reflecting higher bond strength. The co-efficient of thermal expansion of the glasses lies within the range $8.5\text{--}11.5 \times 10^{-6} \text{ } ^\circ\text{C}^{-1}$. Dielectric constant varies from 3.4 to 1.6 and dielectric loss from 0.0016 to 0.0342 at 1 MHz for $50\text{AO}\text{--}5\text{Al}_2\text{O}_3\text{--}30\text{B}_2\text{O}_3\text{--}15\text{SiO}_2$ (A = Ba, Sr, Ca, Zn) glasses. The good thermal, mechanical and dielectric properties show that these glasses can be considered as suitable candidates for interlayer dielectrics in microelectronic applications.

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Alkaline Earth Based Borosilicate Glasses as Sealants in Solid Oxide Fuel Cell Applications



Original Paper Published: 22 February 2019

Volume 12, pages 101–107, (2020) [Cite this article](#)**Silicon**[Aims and scope](#)[Submit manuscript](#)**M. S. Salinigopal, N. Gopakumar & P. S. Anjana** **238** Accesses **10** Citations [Explore all metrics](#) →

Abstract

Alkaline earth based glasses of composition $35\text{AO} - 50\text{B}_2\text{O}_3 - 15\text{SiO}_2$ ($\text{A} = \text{Ba}, \text{Ca}, \text{Sr}$) was prepared by conventional melt quenching technique. Density of the glasses was measured using Archimede's method. X-ray diffraction patterns confirmed the amorphous nature of the glasses. This result was

supported by scanning electron microscope (SEM) image. The structure of the glasses was investigated by FT-IR spectroscopy. FT-IR spectrum revealed the characteristic bands due to various borate and silicate structural units. FT-Raman spectroscopy was used to investigate the characteristic bands of these glasses and its changes due to the presence of various alkaline earth metals. The microhardness of the glass samples was measured by indentation technique. Microhardness of all glasses were high (6.9–7.1) GPa, reflecting higher bond strength. The co-efficient of thermal expansion (CTE) were measured and lie within the range $(8-10) \times 10^{-6} \text{ }^{\circ}\text{C}^{-1}$, which was in good agreement with that of the other SOFC components.

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Structural and magnetic properties of combustion synthesized $A_2Ti_2O_7$ ($A = Gd, Dy$ and Y) pyrochlore oxides

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Abstract. Nanostructured pyrochlore oxides $A_2Ti_2O_7$ ($A = Gd, Dy$ and Y) have been synthesized through a single step auto-igniting citrate complex combustion process. The structure and phase formation of the prepared combustion product were characterized by X-ray diffraction (XRD) analysis. From the XRD patterns, the average crystallite size and lattice strain were calculated using the Williamson–Hall method. Pyrochlore oxides $A_2Ti_2O_7$ ($A = Gd, Dy$ and Y) exhibit a cubic pyrochlore structure with the $fd3m$ space group. The microstructure and average grain size of the samples were examined by scanning electron microscopy. The surface area and pore size of the materials were obtained from Brunauer–Emmett–Teller (BET) analysis. The obtained higher BET surface area of the $Gd_2Ti_2O_7$ material suggests the possibility of excellent photocatalyst activity. The vibrating sample magnetometer studies show that these materials show paramagnetic behaviour at room temperature. These materials have an entropy change that increases when the temperature decreases. So these materials may be used as active magnetic refrigerants at low-temperature.

Keywords. Pyrochlore oxides; X-ray diffraction; surface area; photocatalyst; magnetization.

1. Introduction

Pyrochlore oxides have a general formula $A_2B_2O_7$, where ‘A’ is mostly a trivalent (A^{3+}) rare-earth cation, which includes lanthanides and sometimes Y and Sc, and ‘B’ is mostly a tetravalent (B^{4+}) cation, either a transition metal or a p-block element [1]. A^{3+} larger cations occupying the 16d site are coordinated with eight oxygen ions, while B^{4+} smaller cations occupy the 16c site, located at the centre of the distorted octahedra of oxygen ions and the crystallographic positions of O^{2-} ions are sited at 48f and 8b [2]. The stability of the pyrochlore structure is governed by the radius ratio (r_A/r_B) of A and B cations, which extends from 1.46 to 1.78 [3].

Recently, pyrochlore structured rare earth titanates ($RE_2Ti_2O_7$) have attracted much attention because of the spin-ice behaviour of $Dy_2Ti_2O_7$ compounds, low-temperature magnetic properties and large magnetic moments of paramagnetic materials [4–12]. $Gd_2Ti_2O_7$ and $Er_2Ti_2O_7$ have paramagnetic ordering at room temperature, but they exhibit antiferromagnetic ordering at very low-temperatures, because of predominant antiferromagnetic coupling [13–15]. In the paramagnetic behaviour of pyrochlore oxides, at very low-temperature the value of an entropy change increases when the temperature decreases.

$A_2B_2O_7$ type pyrochlore oxides have been prepared by traditional solid state reactions (1300°C for 40 h) [16], sol-gel [17,18], the polymerized complex method [19,20] and

high-energy ball milling [21] at high temperature and long reaction times. Among these different synthesis methods, solution combustion synthesis is the finest method of producing nanocrystalline ultrafine powders with extremely pure and highly homogeneous as compared to powders prepared with conventional methods. This technique offers an easy and cost effective synthesis with shorter duration (2 h), low-reaction temperature (250°C) and lower calcination temperature (700°C) for synthesizing nanostructured metal oxides. This process involves an exothermic redox reaction between metal nitrates (oxidizing agents) and fuel (a reducing agent). In the combustion process, the product properties such as crystallite size, phase, degree, nature of agglomeration and surface area are generally controlled by adjusting the oxidant–fuel ratio. Here, we report on the preparation details and room temperature magnetic properties of nano-sized $A_2Ti_2O_7$ ($A = Gd, Dy$ and Y) pyrochlore oxides by the auto-ignition combustion process.

2. Materials and methods

2.1 Synthesis of $A_2Ti_2O_7$ ($A = Gd, Dy$ and Y) nanoparticles

Nanocrystalline pyrochlore oxides $A_2Ti_2O_7$ ($A = Gd, Dy$ and Y) have been successfully synthesized by the auto-ignition combustion technique. Analytical reagent grade

Dielectric properties of zinc oxide nanoparticles using annona muricata leaf

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Dielectric properties of Zinc Oxide Nanoparticles Using *Annona Muricata* leaf

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Abstract. Present investigation aims the synthesis and characterization of Zinc oxide (ZnO) nanoparticles using *Annona Muricata* leaf by means of safe, non-toxic, and ecofriendly green method. Structure and crystallite size of the product were examined by X-ray Diffraction analysis (XRD). XRD analysis reveals crystalline nature with hexagonal wurtzite structure in the space group of P63mc having average crystallite size of 21 nm. Peak at 418 cm⁻¹ in Fourier Transform Infrared Spectra (FTIR) corresponds to Zn-O stretching which confirm the formation of ZnO nanoparticles. High Resolution Transmission Electron Microscopy (HRTEM) shows irregular shape particles. Ring nature of Selected Area Diffraction (SAED) pattern indicates poly crystalline nature. UV-Visible spectrum shows a characteristic absorption peak of ZnO nanoparticles at wavelength of 350 nm having optical band gap of 3.14 eV. The morphological characterization of synthesized nanoparticles was done by Field Emission Scanning Electron Microscopy (FESEM) shows agglomerated nanostructures. Energy Dispersive X-Ray analysis (EDX) confirm ZnO nanoparticles with Zn and O atoms. Dielectric measurements have been carried out on sintered pellet in the frequency range 1Hz-100MHz at room temperature. The value of dielectric constant (ϵ') and dielectric loss tangent ($\tan \delta$) was decreases with increase in frequency.

Key words: Zinc Oxide nanoparticles, *Annona Muricata* leaf, Green synthesis, Dielectric property

INTRODUCTION

In recent years, metal oxides having high surface area and aspect ratio play an increasing interest in material science due to their physical, chemical, magnetic, electronic, and catalytic properties compared to bulk materials.¹ Within the large family of metal oxide nanoparticles (NPs) ZnO is an inexpensive, non-toxic, low cost, abundant n-type of II-VI semiconductor compound having applications such as gas sensors, photovoltaic, photo catalytic, light emitting diodes, solar energy conversion, and storage devices due to its wide band gap and high excitation energy.² Many works has been carried out to investigate bio-reduction of various metal ions into metal Nanoparticles.³ Bio-reduction process, the reduction capacity of various biochemical natural and renewable materials such as microbes, fungi, bacteria and plant extract can reduce metal ions into zero-valance metal NPs.⁴ There are several methods for synthesis of ZnO NPs such as co-precipitation, sol-gel, solvothermal, ionothermal, hydrothermal etc.⁵ These are expensive and toxic to environment. So synthesis of NPs via ecofriendly routes become popular among research's due to its low cost, non-toxic, environmental compatibility and ease of applications. It is chemically complex but environmental friendly.⁶ The phytochemicals (flavones, ketones, organic acids, aldehydes and amides) present in the leaf extract act as bio-reductant.⁷ Among these flavones, organic acids and quinones are water soluble phytochemical that is responsible for direct reduction of zinc ions into their respective nanostructures. Reduction in particle size is due to reduction of three types of benzoquinones (cyperoquinone, dietchequinone and remirin) into quinones.⁸ The present study aims environmental friendly, single step, low temperature, ultra-fast, cost effective, non-toxic method for producing ZnO NPs by green biological route, using the extract of *Annona muricata* leaf (family: Annonaceae).

Dielectric properties of copper oxide nanoparticles using *Annona Muricata* leaf

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Dielectric properties of Copper Oxide Nanoparticles Using *AnnonaMuricata* leaf

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Abstract. Present investigation aims the synthesis, characterization and dielectric properties of Copper Oxide (CuO) nanoparticles using *AnnonaMuricata* leaf by means of safe, non-toxic, and eco-friendly green method. The biosynthesized nanoparticles of copper oxide are characterized through XRD, FT-IR, SEM, and UV-Vis spectra. Structure and crystallite size of the product were identified by X-Ray Diffraction analysis (XRD). XRD analysis reveals that prepared nanopowder has crystalline nature with monoclinic structure in the space group of $c2/c$ having crystallite size of 21nm. Peak at 525cm^{-1} in Fourier Transform Infrared Spectra (FTIR) corresponds to Cu-O stretching which confirm the formation of CuO nanoparticles. UV-Visible spectrum shows a characteristic absorption peak of CuO nanoparticles at wavelength of 355nm. Dielectric measurements have been carried out using sintered pellet in the frequency range 1Hz-10MHz at room temperature. The obtained values of dielectric constant (ϵ') and loss factor ($\tan \delta$) were 41 and 0.0014 respectively at 1MHz. A.C conductivity (σ_{ac}) performance shows electrical conductivity increases with increase in temperature, it make applications for electronic devices.

INTRODUCTION

In recent years transition metal oxide having high dielectric constant with low dielectric loss has been used in electronic devices and wireless communication [1]. Among these transition metal oxides Copper Oxide nanostructures has become an encouraged intensive research curiosity due to their electrical, optical, magnetic, catalytic properties arising from quantum confinement and large surface to volume ratio [2]. Copper Oxide has narrow band gap (1.2-2.5 eV) p-type semiconductor compound having applications in field of solar cells, heterogeneous catalysts, gas sensors, high temperature superconductors, lithium-ion batteries and electrochemical capacitors and medical fields as fillers, disinfectants, antimicrobial agents, antibacterial agents, anticancer agents [3]. For the production of nanocrystalline copper oxides physical and chemical method been extensively used. These techniques are hazardous towards surroundings and human health during synthesis procedure because of the use of toxic chemicals, nonpolar solvents, high radiation, and highly active reducing/stabilizing agents [4]. So it is convenient to challenge a cost effective, less complex, eco-friendly, and stable nanoparticles were produced by green approach point researches towards green chemistry and bio-process for the synthesis of nanomaterial's. Rate of production of nanoparticles using plant extract is more attractive because of its simplicity, ease of availability, stability of the resulting products and it uses single step procedure i.e., there is no need for the requirement of culturing, isolation, maintenance [5]. Presence of abundant secondary metabolites and ease of reduction of their salts plants are better suited for the synthesis of metal oxide nanoparticles than any other sources. The present investigation we reports synthesis of Copper oxide nanoparticles by green synthesis method using *AnnonaMuricata* leaf extract.

EXPERIMENTAL DETAILS

$\text{Cu}(\text{NO}_3)_2 \cdot 9\text{H}_2\text{O}$ (99.99%, purity, sigma Aldrich) without further purifications act as precursor for the formation of nanoparticles. *AnnonaMuricata* plant leaves act both as reducing and stabilizing agent. To prepare extract of

EMOTIONAL AND MARITAL PROBLEMS IN A 35-YEAR-OLD WOMAN– A CASE STUDY

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Abstract: This case deals with the study of a 35-year-old woman who comes in with complaining of low self-esteem, emotional and marital problems and lack of concentration in her day to day activities. Qualitative method was adopted in this study. Unstructured interview was used to find out the reasons behind her present problems. She was given a relaxation therapy and asked her to continue for one month and in the next visit she was given cognitive behavior therapy. Seven months follow up sessions were needed. Signs of improvement were observed in the woman after each visit and after completing session she seemed to be happy. The aim of the study was to discover the problem behind her present situation and to eradicate it with the most optimal solution and help her to lead a happy life.

Keywords: Marital and emotional problem, low self-esteem, lack of concentration, Cognitive Behavior Therapy and Relaxation therapy.

1. INTRODUCTION

Marriage is a union between two families and of course between two people. Marital adjustment is defined as the experience of a married couple adapting to a marital relationship. Psychological factors behind marital dissolution are multifaceted. Marriage counseling and prevention programs should be focused on reducing marital dissatisfaction and adjustment problems. Many programs have been assembled and presented for intervention in marriage. These can be classified into 3 major categories: premarital counseling, enrichment programs and marriage counseling for incompatible couples.

2. CASE SUMMARY

This case deals with the study of a 35-year-old woman who comes in with complaining of emotional and marital adjustment problems, low self-esteem and lack of concentration in her day to day activities. She is an elementary school teacher by profession. She had a late marriage and her husband is a driver. She is coming from a low-income family. Both of their family members are more spiritual. She came with her sister. She was away from her hometown and was staying as a paying guest near the school. There she was drugged and abused by the house owner for one month. After that she somehow managed to get down from there and reached her hometown with the help of other teachers. She was very much disturbed and she was facing many problems. An informed consent was signed from the teacher at the time of consultation. This job was very essential for her because she is from a poor family. She has three sisters; her mother goes for domestic help and her father is a security guard. Her husband is staying with his parents. And when she was rescued from there she went to her own home since she could not face her husband. She told everything to her parents and they decided to inform her husband in the presence of a priest. She was very upset. Everything was settled down by the priest and her husband also was convinced and they decided to take her home. But after that she can't adjust to the present situation, she is feeling guilty and so she could not concentrate on anything and also her mother in law somehow got this news about what has happened to her. So, she started to curse her and there occurs the problems. Her husband somehow was accepting and moving on but when his mother started interfering and teasing her, he gradually started moving away from her and so her problems increased. She informed her parents and they decided to take her for a counselling. This affected her a lot and she started become moody again. This started affecting both the husband and the family. She could take care of the day to day activities and always feeling low and started having adjustment problems. All these factors lead to her present status. She is seeking for care and mental support but husband also now could not give her support due



उदयप्रकाश की कहानियों में समकालीनता।

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समाज के बारे में चिन्तित संवेदनशील, प्रयोगशील, प्रतिष्ठित उदय प्रकाशजी हिन्दी ही नहीं विश्व पर बलिष्ठ लेखक है। वे लेखक, कवि, कहानीकार, पटकथाकार, पत्रकार आदि रूप में भी प्रशस्त हैं। लेखकीय जीवन में प्रवेश एक कवि के रूप में हुई। कविता के अलावा समाज कहानियों भी लिखना शुरू किया।

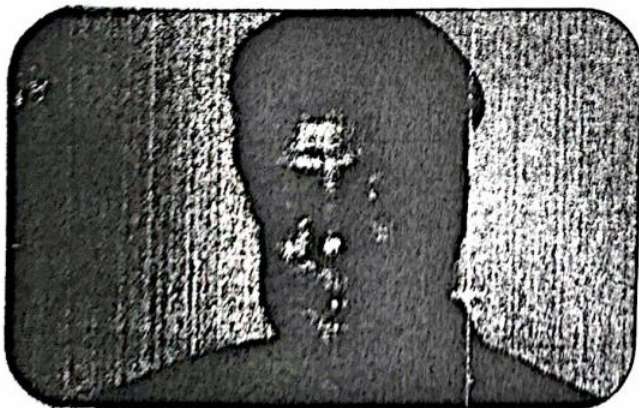
समाज कहानियों का दर्पण होता है। यह निर्विवाद सत्य है। इस सत्य हमें उदयप्रकाश जी की रचनाओं में मिलता है। उदय जी कहानियों में आधुनिक युग की आम जनता के दुःख और पीड़ा की मार्मिक अभिव्यक्ति की है। एक ओर हमारे समाज में ग्लोबल, मोबाइल, लैपटॉप, ग्लोब और मल्टीनाशनल मेट्रो, भोगों-भोगों संस्कृति से समृद्ध थी। दूसरी ओर परंपरागत मूल्यों की दारुण क्षति है। उदयजी की कहानियाँ इन्हीं विषम परिस्थितियों से उपजी हैं। वह उत्तराधुनिक हिन्दी कहानी की नई प्रवणता के प्रतिष्ठापक हैं।

समकालीनता एक दृष्टिकोण है। समय की सच को तटस्थता के साथ परखने की क्षमता किसी को समकालीन बनाती है। उदयप्रकाशजी वर्तमान जीवन प्रणाली की जटिलता को नमकी पूरी सम्मति में गूँथना के साथ सामाजिक, परिवारिक एवं व्यक्तिगत जीवन के गहरी समझ का नाम है।

उदय प्रकाश जी की कहानियाँ अपने समय की समस्याओं और चुनौतियों के साथ संघर्ष करते हुए अपने सामाजिक सरोकार को सामने लाती हैं। इन कहानियों अपने समय के यथार्थ का अनावरण करता है। मानव विरोधी यथार्थ के खिलाफ प्रतिरोध जाहिर करता है।

नेलकटर, डिबिया, अपराध आदि तीन कहानियाँ उदय प्रकाशजी का निजी जीवन से हैं। ये कहानियाँ बहुत छोटी हैं। ये तीनों कहानियों लेखक की अतीत की स्मृतियों हैं, जिन्हें लिखकर वह किसी भारी दुःख के दबाव से मुक्त होना चाहता है। उदय प्रकाशजी कहता है कि "नेलकटर में माँ से उड़े एक करुण बच्चे के करुणा दया है जो नेलकटर के बहाने अपनी माँ को ढूँढता है। 'डिबिया' एक ऐसी कहानी है जो सम्बन्धों की डिबिया की कहानी है। 'अपराध' कहानी में छुटपन के ऐसे बड़े भाई से रिश्ते की कहानी है, जिसका एक पर पाँचवाग्रस्त है।" कहानी का नायक खेल में पिता से झूठ बयान दर्ज करता है। इस झूठ की असर, बड़े भाई पर पड़ता है। बड़े भाई का पिता बुर तरह पीटते हैं। लेखक का माँ-बाप अब दुनिया में नहीं है, नायक की निगाह में वह सच आज भी नहीं कहा जा सकता। सच ना कह सकने कारण अपराध बोध से भर जाता है।

उदय प्रकाशजी अधिकतर कहानियाँ मेलंबी कहानियाँ चर्चा में रही हैं। उनकी छोटी कहानियाँ भी महत्वपूर्ण हैं। डिबिया, सहायक, भीमनग, नलकटर, नौकरी आदि कहानियाँ महत्वपूर्ण हैं। उदयजी कहानियाँ में हम यथार्थ की जादुई हम देख सकते हैं। इसका



एक उदाहरण है 'डिबिया'। 'सहायक' कहानी में हम उदय जी कहता है कि, "यह तब की बात है जब हिन्दी के कवि और अन्य साहित्यकार गाँवों के लोगों के बीच भी उपरिचित नहीं थे" इस पंक्ति द्वारा वह एक बड़ा सत्य को कहता है। आज चौथे-पाँचवीं में पढ़ते बच्चों दाद-दादी या नाना-नानी से अलग रहते हैं। अब बच्चों को रामायण और महाभारत के बारे में कोई जानकारी नहीं है। लेखक कहता है कि "जानते हैं तो हनुमान या गणेश जैसी एनिमोटिड फिल्मों के माध्यम से अब कौन

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समकालीन मलयालम कविता में प्रतिबिंबित पारिस्थिकबोध

डॉ. एस. आर. जयश्री

एसोसिएट प्रोफेसर, महात्मागाँधी कॉलेज, तिरुवनन्तपुरम

आज मनुष्य तथा उसका पर्यावरण एक अन्तर्राष्ट्रीय तथा अन्तः अनुशासन का अध्ययन क्षेत्र है। मनुष्य अपने पर्यावरण से अतीत काल से सचेत रहा है। सांस्कृतिक तथा धार्मिक विकास के साथ ही पर्यावरण की सचेतनता भी हुई थी। मनुष्य के अमुक्तिपूर्ण विकास के परिणाम स्वरूप पर्यावरणीय समस्याओं ने मानव के अस्तित्व पर प्रश्न चिह्न लगा दिया। यह इसलिए कि नव दृष्टि औपनिवेशिक युग में मानव प्राकृतिक पर्यावरण की आन्तरिक निर्भरता को नहीं पहचान रहा है। सांस्कृतिक मूल्यों की मान्यताओं का गिरावट इसका कारण भी है। पर्यावरणीय संकट जिस तीव्र गति से बढ़ता जा रहा है, वह प्रबुद्ध वर्ग के लिए विचारणीय विषय है। इसलिए समकालीन साहित्य इस भावधारा को आत्मसात करके जनजागरण का माध्यम बन गया है। साहित्य के संदर्भ में परिवेश का अपना महत्व होता है। साहित्य में परिवेश वह वातावरण है जिससे साहित्य लिखा जाता है। इस आधार पर साहित्य में परिवेश का प्रश्न परंपरा और समकालीनता का प्रश्न है। परिवेश को विस्तृत रूप से परिभाषित करते हुए डॉ. राजनाथ शर्मा ने लिखा है — “परिवेश देश काल का सतत परिवर्तनशील इकाई है। लेखक को परिवेश से उतना ही संबंध है जितना उसकी चेतना की आँखों से देख सकती है। यथार्थ की भाँति परिवेश भी दिया गया होता है क्योंकि तभी हम चेतना का रास्ता चुनते हैं और उस चुने हुए रास्ते को अपनी परिस्थिति के अनुसार संप्रेक्ष्य बनाना चाहते हैं।” मतलब है परिवेश की मौलिकता रचयिता से संबद्ध होता है, रचना से जुड़ा रहता है। स्पष्ट है कि परिवेश से प्रभावित हुए बिना सृजन कर्म संभव नहीं है। साहित्यकार या लेखक जिस परिवेश में रहता है, जो कुछ देखता है, अनुभूत करता है उनको अपनी रचना में प्रस्तुत करते हैं। लेखक अपने समय का प्रतिनिधि है। इसलिए समकालीन मलयालम कवियों ने पारिस्थितिक बोध को अपनी कविता की विषयवस्तु के रूप में अपनाया है। “पारिस्थितिक दर्शन का अर्थ मनुष्य और प्रकृति के बीच के संबंध को विभिन्न नजरिए से परखना है। प्रकृति और मनुष्य के केन्द्र में रखनेवाली विभिन्न दृष्टियाँ हैं।” इस दौर में सच्चिदानंदन, ओ.एन.वी. कुरूप, कुरीप्पुषा श्रीकुमार, सेबास्टिन, सुगतकुमारी, आर.रमेशन नायर, एन. एन. कक्काट, वि.आर. संतोष, राजनकैलास, रामचन्द्रन, टि. पी. राजीव, एस. जोसफ, मनोजकुरुर, ए.आर. रेणुकुमार आदि की कविताओं में अलग दृष्टि अलग रूपों में पारिस्थिक प्रदूषण के प्रतिरोध का सामाजिक जनवादी स्वर मुखर है।

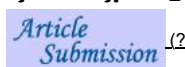
कवि सच्चिदानंदन ने “आत्महत्या किए किसान पानी के लिए बोलता है”, शीर्षक कविता में तकनीकी संस्कृति की त्रासदी पर विचार प्रकट किया है—

पानी स्वर्ग का बर्फ था
बड़े दृढ़ बूदों की दुआओं में मिलकर
स्रोतों की सूर्यकान्ती बनकर
वे धरती पर फूले गए.

अर्थात् जल ही मानव की मातृभाषा है। जल के अजस्र प्रवाह से हमने ज्ञान का प्रकाश और सभ्यता की लहर अपनायी, नदी माँ का दूध और लोरी के समान है। लेकिन अब पीड़ित नदी अपनी माँ को पुकारकर पाताल में विलीन हो गयी। आगे कवि कहते हैं कि जब तक नदी में पूर्णिमा की चाँदनी की झलक नहीं होती तब तक उनकी आत्मा की प्यास बुझ नहीं सकती। भाव यह है कि केरळ की प्रकृति नदी और नालों से संपन्न हरी भरी थी। लेकिन आज प्रकृति और पर्यावरण पर मानवीय हस्तक्षेप अत्यधिक बढ़ा है, जिससे पर्यावरण का चेहरा बीभत्स हुआ है। कवि की संवेदना सहज और रागमयी है और साथ साथ पारिस्थितिक सजगता प्रदान कर देनेवाली प्राज्जोल का अहसास भी है। श्रीकुमारन तंपी की “मुड़कर देखने पर” शीर्षक कविता में प्रकृति की प्रतिक्रिया और जीवन भर उसके प्रभाव का अनेक रूपों में वर्णन किया है।

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A New Parallel Number System in Hindi with Hindi Version and Transliteration

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Abstract

Hindi, our national language, is relatively simple in terms of the listening, speaking and writing skills required. However, the number system of the language poses a major stumbling block for learners, especially in the case of beginners and foreigners. The existing system is quite easy for those who are good in Hindi or those who were born and brought up in states that use Hindi as a first language. Here, I would like to discuss the possibility of a parallel numbering system for the language. It will serve to improve the interest of learners of the language in a more systematic manner. The new parallel number system is developed with the help of twenty-nine conventional numbers in Hindi. Those who internalise these twenty-nine numbers and the pattern of the formation of new number can handle numbers from zero to thousand quite easily. For example, fifty in both the conventional Hindi number system and the proposed system is 'Puchaass'; but fifty-seven in the conventional Hindi number system is 'Suttaawun', whereas per the new parallel number system, it is Puchaass Saath. Those interested have ample opportunities to add more numbers in this format.

Keywords

Hindi, Language, New, Parallel, Number.

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Hematological Studies On The Effect Of Dibutyl Phthalate On The Piscine Model, *Oreochromis mossambicus*

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Abstract: Study of blood parameters has gained momentum in recent years in view of its importance in diagnosing various abnormalities due to toxic effects of pollutants. Fish blood is a pathophysiological indicator of the whole body function and therefore blood parameters are important in diagnosing the structural and functional status of fish. Phthalates are considered to be a potential carcinogen, teratogen, and mutagen in vertebrates. In order study the effect of Dibutyl Phthalate on a vertebrate system, we have chosen the readily available and stress tolerant variety, *Oreochromis mossambicus*, as the model organism for the study.

Index terms: Dibutyl Phthalate, *Oreochromis mossambicus*, Hemocrit, Hemoglobin, Blood count

I. INTRODUCTION

Hematology is defined as the branch of biology, which deals with the morphology of blood and blood forming organs. Blood is the life-sustaining body fluid, which governs very important functions of the body like respiration, circulation, excretion, osmotic balance and transport of metabolic substances. The study of blood parameters has gained momentum in recent years in view of its importance in diagnosing various abnormalities due to toxic effects of pollutants. The red blood cells (RBCs) and hemoglobin (Hb) level vary at different stages of life in the same organisms. Over many years the hematological investigations have become important diagnostic tools in medicine, they equally serve as diagnostic indices to investigate diseases or stress even in fish. Physicomorphological changes in blood indicates the changes in quality of the environment and therefore they are important in diagnosing the functional status of the animal and exposed to toxicants and have greater contribution to the pathological changes obtained during toxicological studies. Fish live in very intimate contact with their environment and are therefore very susceptible to physical and chemical changes, which may be reflected in their blood components. Blood being the medium of intercellular transport, which comes in direct contact with various organs and tissues of the body, the physiological state of an animal at a particular time is reflected in its blood. Fish blood is being studied increasingly in toxicological research and environmental monitoring as a possible indicator of physiological and pathological changes in fishery management and disease investigations. Fish blood is a pathophysiological indicator of the whole body function and therefore blood parameters are important in diagnosing the structural and functional status of fish. Blood is a pathophysiological indicator of the body as it is highly susceptible to internal and external environmental fluctuations in stress conditions.

Fresh water teleost fishes maintain their normal physiological process and their body fluid homeostasis with the help of ion/osmoregulatory process. Alterations in physiology and biochemical parameters of toxicant treated fish have recently emerged as an important tool for water quality assessment in the field of environment toxicology. This is because blood in the gill has direct contact with the water medium and any unfavorable change in the water could be reflected in the circulatory system. These studies could be used to indicate the health status of the fish as well as quality.

Hematological studies plays an important role in understanding variation of blood characteristics in relation to factors like phylogenetic position, ecological habitat, pollutants, food selections, etc. The regular monitoring of the fish blood is a diagnostic tool in establishing the health status of the fish in farm. It helps in evaluating the response of different types of blood cells and its components of physiological stress due to toxicity, as it quickly reflect the poor conditions of fish than other commonly measured parameters. The blood composition of a fish reflects to some extent to metabolic and other physiological processes. Accordingly, hematology can be used as clinical tool for the investigations of physiological and metabolic alterations in fish caused by pollution of the aquatic environment.