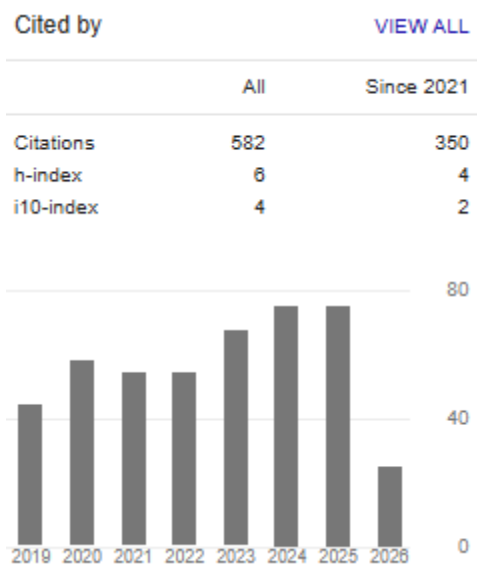


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WATER QUALITY INDICES- IMPORTANT TOOLS FOR WATER QUALITY ASSESSMENT: A REVIEW

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Abstract

Water quality is a significant criterion in matching water demand and supply. Securing adequate freshwater quality for both human and ecological needs is thus an important aspect of integrated environmental management and sustainable development. To represent water quality in a lucid way different water quality indices for water quality assessment are used which aim at giving a single value to the water quality of a source reducing great amount of parameters into a simpler expression and enabling easy interpretation of monitoring data. In this review, various water quality indices (WQI) used for assessing surface water quality are discussed. As different National and International Agencies involved in water quality assessment and pollution control defines water quality criteria for different uses of water considering different indicator parameters, so there are numerous WQI specific to any region or area. An attempt to cover different water quality indices developed worldwide, their background and application area has been discussed here.

Key words: Water Quality, index, review, water parameters, quality scale

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A HPLC-UV METHOD FOR DETERMINATION OF THREE PESTICIDES IN WATER

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Abstract

HPLC method is developed and validated for determination of three pesticides (abamectin, imidacloprid, and β -cyfluthrin) in water. These pesticides are used widely in agriculture for crops protection, and may be leached to the groundwater. Reversed-phase method with C18 column (5 μ m, 250mm $\times$ 4.6 mm inner diameter) using a mobile phase consisting of acetonitrile/water (v:v = 4:1) at a flow rate of 1.5 mL/min and UV detection at 220 nm was used. This method is validated according to new methods which include accuracy, precision, linearity and range, limit of detection and limit of quantitation. The current method exhibits good linearity over the range of 1-1000 ppb for abamectin, 0.5-1000 ppb for imidacloprid, and 0.4-1000 ppb for β -cyfluthrin with r^2 greater than 0.990. The percentage recovery of the method at three concentration levels (5, 100, and 1000 ppb) is within 97.6 to 101.5% for the three pesticides. Relative standard deviation of the area of six replicate injections of each pesticide at three concentration levels (5.0, 100.0, and 1000.0 ppb) was found to be less than 1% which reflect the precision of the method. Limit of quantitation of the three pesticides using this method is low (1.0, 0.5, and 0.4 ppb) for abamectin, imidacloprid, and β -cyfluthrin, respectively which enables the determination of these three pesticides in water at low concentration levels. Keywords : Abamectin, Imidacloprid, β -cyfluthrin, pesticides, HPLC-UV, validation

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LOW PLATELET COUNT ASSOCIATED WITH DENGUE HEMORRHAGIC FEVER

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Abstract

Dengue is an infectious mosquito borne disease of tropical regions. There is a drastic change in the demographic characteristics of dengue fever in Pakistan over the past years. Many small studies have been done previously all over the country but the data reported so far regarding demographic, biochemical and hematological parameters of dengue infection is insufficient. This study was undertaken to establish a possible association of decrease in platelet count with bleeding tendency in dengue patients. It is an observational cross-sectional study conducted on 50 sero positive cases during the early days of dengue virus infection (1-7 days) confirmed by Real time PCR (CDC Atlanta) in a tertiary care hospital in Lahore. Patients of both sexes and all age groups were included. The study was approved from ethical committee of King Edward Medical University. 3-5 ml of venous blood was taken from the patients during first 7 days of infection for CBC analysis. Consent was taken from patients or guardian in case of children and proforma was also filled after interviewing the patient. This article assesses the association of severity of disease with age, gender, platelet count and bleeding tendencies in dengue patients. More dengue patients had declined platelet counts

KEY WORDS:Dengue, platelet count, bleeding tendency, Lahore

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SPECTROPHOTOMETRIC DETERMINATION OF ZIRCONIUM USING CHROME AZUROL S (CAS) AS COMPLEXING AGENT IN AQUEOUS STREAMS OF NUCLEAR FUEL REPROCESSING

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Abstract

A sensitive and reproducible method for the direct spectrophotometric determination of zirconium is reported. The method is based on zirconium forms a stable bluish violet colour complex with Chrome Azurol S (CAS) which has maximum absorption at 598 nm at pH 4.2. The complex obeys Beer's law in the concentration range of 1-7 $\mu\text{g/mL}$. Detection limit, molar absorptivity and Sandell's sensitivity were 2.42 $\mu\text{g/mL}$, $3.93 \times 10^3 \text{ L.Mol}^{-1} \cdot \text{cm}^{-1}$ and $2.54 \times 10^{-4} \mu\text{g/cm}^2$ respectively. Relative standard deviation is less than 2% and correlation coefficient is 0.997. The present method is highly sensitive, selective, rapid and simple. It is directly applicable for the determination of zirconium in environmental, industrial, water and nuclear reprocessing samples.

Keywords :Zirconium, Chrome Azurol S, molar absorptivity, Acetate buffer

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METALLO - BIOACTIVE COMPOUNDS AS POTENTIAL NOVEL ANTICANCER THERAPY

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ABSTRACT

Mono and bi-organometallic complexes of Cu(II), Ni(II), Mn(II), Zn(II) and Ag(I) complexes with oxaloamide ligand has much potential as therapeutic and diagnostic agents. The ligand allows the thermodynamic and kinetic reactivity of the metal ion to be controlled and also provide a scaffold for functionalization. Specific examples involving the design of metal complexes as anticancer agents are discussed. These complexes have been synthesized and characterized by (¹H-NMR, mass, IR, UV-VIS, ESR) spectra, magnetic moments and conductance measurements, elemental and thermal analyses. Molar conductances in DMF solution indicates that, the complexes are non-electrolytes. The ESR spectra of solid Cu(II) complexes (2-5) show an axial type indicating a d(X²-y²) ground state with a significant covalent bond character. However, Mn(II) complex(9), shows an isotropic type indicating an octahedral geometry. Cytotoxic evolution IC₅₀ of the ligand and its complexes have been carried out. Cu(II) Complexes show enhanced activity in comparison to the parent ligand or standard drug. Copper is enriched in various human cancer tissues and is a co-factor essential for tumor angiogenesis processes. However, the use of copper binding ligand to target tumor, copper could provide a novel strategy for cancer selective treatment.

KEYWORDS :Complexes, Synthesis, Schiff Base, ESR, Cytotoxicity.

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**CHEMICAL DURABILITY AND CHARACTERIZATION OF THE
PHOSPHATE GLASSES CONTAINING IRON, SODIUM AND
CHROMIUM**

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Abstract

In order to prepare a high quality glass with high water resistance, we investigated chromium iron phosphate glass because of its improved chemical durability. The introduction of chromium in sodiumiron-phosphate glasses is used to compare its effect with iron in inhibition of corrosion. The sodiumchromium-iron phosphate glass of composition $30\text{Fe}_2\text{O}_3\text{-xCr}_2\text{O}_3\text{-(15-x)Na}_2\text{O-55P}_2\text{O}_5$ (mol %), with $(0 \leq x \leq 4)$ was produced by melting batches of (99,98% pure) Cr_2O_3 , Fe_2O_3 , Na_2CO_3 , and $(\text{NH}_4)_2\text{HPO}_4$ at 1080°C for one hour and pouring the liquid into the bench. The sample was annealed at 650°C for 48h. We have performed the measurement of X-Ray diffraction, and Infra Red spectroscopy. The chemical durability was evaluated by weight losses of glass samples after immersion in hot distilled water (90°C) for 30 days. Weight loss measurements showed a good chemical durability unlike borosilicate glass.

Keywords: Chemical durability, IR spectroscopy, Scanning electron microscopy, glass formation, Sodium-chromium-iron-phosphate glasses, XRD, iron oxide, chromium oxide, sodium oxide, phosphate oxide.

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ARTIFICIAL NEURAL NETWORK APPROACH TO MODELING OF POLYPROPYLENE REACTOR

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ABSTRACT

This paper shows modeling of highly nonlinear polymerization process using the artificial neural network approach for the model predictive purposes. Polymerization occurs in a fluidized bed polypropylene reactor using Ziegler - Natta catalyst and the main objective was modeling of the reactor production rate. The data set used for an identification of the model is a real process data received from an existing polypropylene plant and the identified model is a nonlinear autoregressive neural network with the exogenous input. Performance of a trained network has been verified using the real process data and the ability of the production rate prediction is shown in the conclusion.

KEYWORDS: Identification, model predictive control, neural networks, polypropylene, fluidized bed reactor

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DEVELOPMENT OF ECO-FRIENDLY FLAME RETARDANT FABRIC USING PHOSPHOROUS BASED INTUMESCENCES CHEMISTRY

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Abstract:

A novel flame retardant application technique was developed for cotton apparel fabric using spirocyclicpentaerythritol di (phosphoryl chloride) (SPDPC), which was further synthesized into bisdiglycolspirocyclicpentaerythritolbisphosphate (BSPB). The flame retardant agent was then attached to the fabric using a sol-gel process. The treated fabric was tested on a vertical flame tester which showed very high flame retardancy as compared to the untreated cotton. TGA analysis exhibited a slow rate of weight loss and higher ultimate degradation temperature for the FR treated sample. The FR treated sample showed modest loss in strength while retaining 86.4% of its original strength. The fabric's appearance did not alter and the change in stiffness was insignificant as a result of the FR finish.

Keywords: flame retardant, synthesis, SPDPC, TGA

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STUDY ON THE PROPERTIES OF PTMG

TOUGHENER MODIFIED EPOXY RESINS

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ABSTRACT

The E-51 epoxy resin was modified by PTMG toughener. The resin was cured under high temperature methyl tetrahydrophthalic anhydride (MeTHPA) as Tris(dimethylaminomethyl)phenol (DMP shows that PTMG significantly reduced the glass transition temperature of test results shows that the presence of PTMG in the cured material increased maximum impact strength was achieved modulus, flexural strength, and fle smaller than the valve value, PTMG increased the cured material's tensile and flexural strength as well as its tensile and flexural modulus. While the mass fraction of PTMG was larger than increase of the mass fraction of PTMG reduced the cured material's strength and modulus.

KEYWORDS: Toughener, Epoxy Resin, PTMG

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The Vinland Map: Transmission Electron Micrograph of the Ink

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Abstract:

The evidence that the Vinland Map is a modern forgery is not supported by the bi-pyramidal shape of the anatase crystals shown in the transmission electron micrograph of the ink of the Map. The proposed presence of a modern pigment was related to the identification of the anatase shown in the micrograph as having a rounded regular crystalline shape as contrasted to the bi-pyramidal shape that this paper has identified .

Keywords: Vinland Map, transmission electron micrograph of ink, anatase, goethite

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