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Physical Sciences

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EFFECT OF TEMPERATURE OF BINDING LIQUID ON SOME TABLET PROPERTIES

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The effect of temperature of the granulating fluid on some physical properties of lactose granules and tablets was investigated. Checks on granule size, flow rate and tap density of the granules and hardness, friability and disintegration time at temperatures between 20° and 60°C were carried out. Also, temperature effect on the viscosity of the granulating fluids, water and maize starch mucilage, was observed. The viscosity of maize starch mucilage was found to decrease as temperature increased, while there was no noticeable effect on water. Also, it was found that the granule size increased with temperature up to about 50°C after which there was no more increase. The flow rate followed the same pattern, except that there was a decrease beyond 40°C. The tap density was not significantly affected, thus signifying that flow of granules from the hopper to the die in the tableting machine was not affected equally. The tablet hardness increased as the temperature decreased from 60° to 25°C while friability showed a reverse. Standardization of the temperature of the granulating fluid is therefore essential.

Key words: Temperature effect, Granulating fluid, Granules, Tablet properties.

DIELECTRIC RELAXATION STUDIES OF SOME AROMATIC HYDROCARBONS AND THEIR NAPHTHENE MIXTURES

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The frequency dependence of complex dielectric constant ϵ^* , and the loss factor ' $\tan \delta$ ' for xylene isomers (para, meta and ortho-xylene), pure naphthene and 50% mixture of naphthene have been studied from 100 KHz to 100 MHz. The dielectric relaxation process has also been studied. The data has been analyzed in terms of Cole-Cole and Higasi type distribution. The results obtained for xylene isomers are in agreement with, Cole-Cole type of semicircle representation. Relaxation time ' τ ' has been calculated from viscosity data obtained from Happlier apparatus, at four different temperatures. To study the effective relaxation mechanism of molecules in polar solute and solvent and their mixtures, along with the given values of heat of absorption of these liquids, Hartshorn and Ward apparatus has been used for the measurement of dielectric parameters. The results support our assumption that the dielectric absorption in xylene isomers is due to overall molecular rotation.

Key words: Dielectric constant, Relaxation time, Viscosity, Loss factor.

EVALUATION OF DISSOCIATION AND THERMODYNAMIC CONSTANTS OF QUINOLINE USING POTENTIOMETRIC METHOD IN AQUEOUS AND MIXED ORGANIC-WATER SOLVENTS

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The dissociation constant (pK_a) and thermodynamic parameters Gibb's free energies (ΔG) of quinoline compound are determined by potentiometric pH titrations in aqueous solutions at 25 to 50°C and in various mixtures of water and organic solvent systems at 25°C $\pm$ 0.1°C.

It is observed that the mixed ionization constant (pK_a^M) and thermodynamic ionization constant (pK_a^T) values of quinoline decrease with the increase of temperature and concentration of organic-water solvent systems. The curve is a parabolic one. These results are discussed in terms of solvent characteristics, solvent basicity and stabilization of conjugate acid for base by hydrogen bonding interaction in hydro-organic solvent media.

The values of dissociation constant are calculated by a computer programme written in GW-BASIC. From pK_a values Gibb's free energies ΔG for the respective pK_a values are computed and discussed in terms of solute solvent interactions.

Key words: Dissociation constants, Potentiometry, Quinoline, Thermodynamic-parameters.

STUDIES ON SEAWEED EXTRACTED ELICITORS AND THEIR ANALYSIS FOR ANTIMICROBIAL ACTIVITY IN CHICKPEA COTYLEDONS

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High Molecular Weight Crude Elicitor Preparations HMWCEP obtained from *Hypnea musciformis* (red algae) were used for elicitation of biologically active secondary metabolites of chickpea (*Cicer arietinum*) cotyledons. Elicited tissues were extracted with 95% alcohol, concentrated and stored in the fridge. A yellow ppt was collected and fractional extraction of the supernatant provided total alcoholic Ext.1, pet ether Ext.2, chloroform ethyl acetate (3:7) Ext.3 and the residual aqueous Ext.4. Yellow ppt and various extracts were evaluated for their antifungal activity. Ext.2,3 and 4 showed elevated antifungal activity on treatment against some pathogenic and non pathogenic fungi. HPLC method was developed for the separation of complex mixture of induced secondary metabolites of chickpea tissues by the treatment of seaweed elicitors.

Key words: *Cicer arietinum*, Elicitor, *Hypnea musciformis*, Induced secondary metabolites, Antimicrobial activity.

SORPTION BEHAVIOUR OF 3-(3,4-DICHLOROPHENYL)-1, 1-DIMETHYL UREA ON SOIL

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The sorption capacity of three soil samples containing organic matter between 0.52 and 1.66% and clay fraction between 1.30 and 4.60% for 3-(3,4-dichlorophenyl)-1,1-dimethyl urea (diuron) in aqueous solution was examined at 29°C. It was found that between 40 and 60% of the herbicide was adsorbed by the soils and that the sorption capacity depended on the total colloidal fraction of the soils. The soil/water adsorption coefficient, K_d , of the herbicide was used to assess the relative phytotoxicity of the herbicide in the given soils.

Key words: Sorption capacity, Colloidal fraction, Dimethyl urea.



Short Communication

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**LOW SPIN TRINUCLEAR COMPLEXES OF
LABILE VITAMIN B₁ WITH COBALT (II)**

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Technology, P M B 704, Akure, Ondo State, Nigeria*

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Short Communication

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Biological Sciences

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HEAVY METAL ACCUMULATION IN ROAD SIDE VEGETATION OF URBAN AREAS OF KARACHI

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Lead and heavy metal accumulation in the tarry deposits on the leaves of trees and shrubs grown along road side of urban area has been determined. Samples of leaves were collected in summer and winter. Pb, Cu, Mn and Zn were analysed from the tarry deposit. The range of average concentration of lead was around 250 to 1155 ppm, copper around 845 to 100 ppm, manganese 171 to 650 ppm and zinc 103 to 706 ppm. The gravitational sedimentation and impact on vegetation of coarse fraction is responsible for high lead contamination. Areas of greater traffic density have vegetation with higher lead levels. The data collected shows that almost all the pollutants are being generated by automobile exhaust in the urban area of Karachi.

Key words: Tarry deposit, Heavy metals, Vegetation, Karachi.

FORCELLINIA TUMULUS, A NEW SPECIES IN PAKISTAN BELONGING TO THE FAMILY ACARIDAE (ACARI)

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(Received 16 May 1998; accepted 31 May 2000)

Form Central Punjab, Pakistan, a new species (Hypopus) *F. tumulus* of the family Acaridae is described and documented. It belongs to the genus *Forcellinia* Oudemans, 1924. Differential features are integrated in to key and characters of the species are compared with those of the world known species.

Key words: *Forcellinia*, Mite, Hypopus, Acaridae, Pakistan.

ACUTE TOXICOLOGICAL EVALUATION OF THE AQUEOUS EXTRACT OF *ECLIPTA ALBA* HASSK

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(Received 26 December 1998; accepted 3 June 2000)

Acute toxicological evaluation of *Eclipta alba*, Hassk, was carried out on albino mice through oral, parenteral and systemic routes. The severity and depth of toxicities exhibited by either route were found to be dose dependent. The aqueous extract of *E alba* exhibited a marked action on the central nervous system. LD50 as calculated for oral, intravenous and intraperitoneal routes were 7.841 g kg⁻¹, 302.8 and 328.3 mg kg⁻¹ respectively. An aqueous extract of *E. alba* was found to be safe and non-toxic at a dose of 2.0 g kg⁻¹ for oral and 200 mg kg⁻¹ for intravenous and intraperitoneal routes.

Key words: *Eclipta alba* Hassk., Toxicity study, *E prostrata*, Compositae.

CLUSTER ANALYSIS OF VEGETATION OF SWAT DISTRICT

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For drawing a quantitative picture of Swat vegetation, 21 quadrats (stands) (10x10 m for arboreal vegetation and 2x2 m for herbs and shrubs) were studied. On the basis of importance value, twenty one plant communities were established and computerized cluster analysis of 267 species was carried out. One stand showed greatest diversity. Five stands were slightly different from each other whereas six stands were closely related.

Key words: Cluster analysis, Vegetation, Swat flora.

PREPARATION OF PHARMACEUTICAL GRADE SODIUM AESCINATE AND AESCIN POLYSULPHATE SALT FROM *AESCULUS INDICA* SEEDS

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(Received 23 July 1998; accepted 10 June 2000)

Efficient methods for the preparation of pharmaceutical grade aescin, sodium aescinate and aescin polysulphate sodium salt from the carefully dried seeds of *Aesculus indica* Wallex Camb, HkF (Hippocastanaceae) have been described. The identity and purity of products was achieved through comparison with standards using potentiometric assay, HPLC, UV, IR, NMR spectroscopy and mass spectrometry.

Key words: *Aesculus indica*, β Aescin, Sodium aescinate, Aescin polysulphate salt.

Short Communication

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VARIABILITY IN YIELD AND VOLATILE CONSTITUENTS OF *CYMOPOGON* *JAWARANCUSA* (JONES) SCHULT FROM PAKISTAN

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Cymbopogon jawarancusa (Gramineae) (Kirtikar and Basu