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Pak J Sci Ind Res 1999 **42** *(2) 59-62*

Effect of pH on Ni Adsorption in Organo-mineral Complexes

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Adsorption of nickel on four different soils were studied. These were: Gujranwala series, Kotli series, Lyallpur series and a Pacca series. Effect of organic matter and pH on nickel adsorption were studied. The pH greatly influenced the characteristics of adsorption isotherms. Kotli series H-Clay complexes adsorbed more Ni than corresponding H-clays at all pH while reverse was true in Pacca series, Gujranwala series and mixed behaviour was noted in Lyallpur series. Organic matter solubilization took place at pH >5.0 in Lyallpur series.

Key words: Nickel adsorption , Organic matter, Organo-mineral.

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VIBRATIONAL ANALYSIS OF CROSS-LINKING AGENTS SPDP AND LC-SPDP

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Infrared and Laser Raman spectra of the compound, N-succinimydyl 3- (2- pyridyldithio) proprionate (SPDP) and N-succinimydyl [3-(2-pyridyldithio) propionate] hexanote (LC-SPDP) are recorded in the region 100 - 4000 cm^{-1}. A few observed bands are assigned to various modes of vibrations on the basis of normal coordinate calculations assuming C_s point group symmetry to the molecules. A complete set of internal coordinates used for the calculations also presented.

Key words: IR, Laser Raman Spectra, Vibrational analysis, SPDP, LC-SPDP.

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STUDIES ON THE MIXED LIGAND COMPLEXES OF Cr (III) AND Co (III) CONTAINING MONOBASIC ACIDS AND TETRAAZA MACROCYCLES

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(Revised 26 November 1995; accepted 20 August 1997)

A few mixed ligand macrocyclic complexes of Cr (III) and Co (III) of the formula trans $[M(X_2)\,L]\,Cl_2$ where M = Cr (III), Co (III); X = anion of acetic acid (Ac), propionic acid (Pr), butyric acid (Bu); L = 5, 7, 7, 12, 14, 14-hexamethyl-1, 4, 8, 11, -tetraazacyclotetradeca-4, 11-diene dihydro dibromide dihydrate (L. 2HBr. $2H_2O$) have been synthesized and characterized by elemental analyses, conductometric, magnetic measurements, IR and electronic spectral studies. The complexes are low-spin species with a trans configuration.

Key words: Mixed ligand, Macrocyclic complexes, Low spin species.

Pak J Sci Ind Res 1999 42 (2) 74-77

PREPARATION OF GRAFT COPOLYMER MAIZE-STARCH-G-ACRYLONITRILE AND ITS SAPONIFICATION

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Graft copolymer of acrylonitrile onto maize-starch using ceric ammonium nitrate as a catalyst has been prepared. The effect of monomer, backbone and catalyst concentration on rate of conversion of monomer (Rp), rate of graft copolymerization (Rg), grafting efficiency (GE) and grafting rate (GR) have been discussed. The absorption of water by saponified product of graft copolymer is determined. The effect of sodium chloride on saponified product is also discussed.

Key words: Graft copolymer, Maize-strach, Cat. lyst

Pak J Sci Ind Res 1999 **42** *(2) 78-82*

RETARDING EFFECT OF Ce(IV), Ce(III), Cu(II) AND Zn(II) AS ACCEPTOR CENTERS ON THE HYDROLYSIS RATE OF H_2 SALEN

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(Received 10 July 1995; accepted 17 February 1998)

The rates of hydrolysis of N-N`-salicylidene-ethylenediamine (H_2salen), have been investigated in the pH range 1.50-11.30 at 25°C in aqueous media containing 7% V methanol. It was observed that the rates of hydrolysis were dependent on pH values more basic than pH 9.20. The rate-limiting step in such media was suggested to be the attack of hydroxide ions on the H_2salen as a keto-form. The pH-independent reactions occured at pH region 9.20-6.35. At pH values more acidic than 6.50, the hydrolysis rates became pH-dependent again and were correlated with the conversion of the substrate to its conjugate acid. Under these conditions the predominant reaction was attack of water molecules on the protonated substrate. Furthermore, effects of certain transition metal ions viz Ce(IV), Ce(III), Cu(II) and Zn(II) on the hydrolysis reaction rate have been examined and interpreted on the basis of formation of tricyclic chelate rings. Thermodynamic parameters have been also determined and discussed.

Key words: Retarding effect, Hydrolysis rate, H_2 salen.

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COMPLEXES OF Co (II), Ni (II), Cu (II), Zn (II), Cd (II) AND Hg (II) WITH ON-NO DONOR TETRADENTATE LIGAND

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Fifteen complexes of composition $[MLX_2]$ have been prepared where M=Co (II), Ni (II), Cu (II), Zn (II), Cd (II) and Hg (II); X=Cl^-, NO_3^-, SCN^-; L=1,9- dibenzoyl - 2,8-di (p-methoxy phenyl) -3,7- diazanonane. The ligand possesses ON - NO donor atoms and forms mononuclear complex compounds with the above metal ions. The complexes have been characterised to be either octahedral or distorted octahedral basing upon conductance, magnetic susceptibility, IR, electronic, NMR and ESR spectra apart from x-ray diffraction data.

Key words : Metal complex, Tetradentate ligand.

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BIOCHEMICAL CHANGES IN WHEAT SEED DUE TO THE EFFECT OF BLACK POINT AT DIFFERENT LEVELS OF MANURING

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This study was carried out to demonstrate the effect of black point on the changes of biochemical constituents in wheat seed at different levels of manuring. Starch and total soluble carbohydrates of wheat decreased, while prolamin, glutelin and phenolics increased with the change of manuring schedule levels but method of urea application had no effect on carbohydrate and showed a tendency towards increase in total phenol and prolamin. On the other hand, glutelin and orthohydroxyphenol content showed decreasing tendency under similar conditions. Nitrogen alone, or in combination with cowdung, increased the number of infected wheat seeds; it was also true for methods of N application. Black point pathogens decreased starch, soluble carbohydrates and increased phenolics, prolamin and glutelin content in infected wheat seed. Due to infection marked fluctuation was observed in the contents of reducing sugar, total phenol and prolamin of the seed.

Key words: Biochemical constituents, Wheat seed, Black point, Manure, Fertilizers.

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RELATIONSHIP OF SEED-BORNE FUNGI TO FIELD DISEASES OF SUNFLOWER

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Twenty one seed-borne fungi were recorded from 196 seed samples collected from seeds used for sowing of sun-flower crop and a total of ten field diseases were recorded during survey of sunflower crop in 1991-92. All the field diseases observed in this survey are known to be seed transmitted. The causal organisms of five field diseases namely Alternaria leaf spot, charcoal rot, head rot, Phoma leaf spot/black stem rot and Phomospsis leaf spot were found to be associated with seeds. In germination test, it was found that role of seed-borne fungi in causation of various abnormalities in germination depended on the frequency of their occurrence in the seeds.

Key words : Sunflower, Seed-borne fungi, Field diseases.

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VOLATILE CONSTITUENTS OF THE LEAVES OF PAKISTANI *CUPRESSUS SEMPERVIRENS* AND *THUJA ORIENTALIS*

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(Received 27 February 1995; accepted 1 June 1998)

Essential oils obtained from leaves of *Cupressus sempervirens* L and *Thuja orientalis* L. by hydrodistillation were analysed by a combination of capillary gas chromatography and mass spectrometry. The main components of the C. *sempervirens* were α-pinene (38.9 %), Δ^3-carene (31.2%), cedrol (6.4 %), 4-terpinylacetate (4.0 %) and β-myrcene (4.0 %), while the *T.orientalis* L. oil contained α-pinene (40.6 %), β-caryophyllene (6.8%), cedrol (10.7 %), β-myrcene (3.7 %), R-(+)-limonene (3.2 %), and alloaromadendrene (7.8 %).

Key words: *Cupressus sempervirens* L., *Thuja orientalis* L., Monoterpenes, Sesquiterpenes.

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Modelling of Interfacial Chemical Kinetics and Equilibrium to the Design of Liquid-Liquid Continuous Contractors

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A laboratory spray column of variable height was used for the extraction of zinc from an aqueous sulphate solution by di (2-ethylhexyl) phosphoric acid (DEHPA) in n-heptane. Three sets of nozzles of different diameters were employed in order to change the Sauter mean diameter of the dispersed phase. Experiments covered a wide range of concentrations and flow rates. Experimental results were compared with predictions obtained by using the two design algorithms (one based on the interfacial chemical kinetics, the other on interfacial equilibrium). Results simulated with the kinetic model were in good agreement with experiments over the whole range of conditions investigated, the equilibrium model underestimated the column heights by factors ranging between 0.25 and 0.5.

Key words: Contractor height, Kinetic efficiency, Equilibrium model.