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Physical Sciences Section

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Studies on Mixed Ligand Complexes of Iron (III), Chromium (III) and Nickel (II) Containing Dicarboxylic Acid and 5, 7, 7, 12, 14, 14 Hexamethyl 1, 4, 8, 11 Tetraazacyclotetradeca 4, 11 Diene

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Mixed ligand complexes of Fe(III), Cr(III) and Ni(II) with dicarboxylic acid and 14 membered tetraazamacrocycles have been synthesized. The general composition of the complexes are trans-$[M(DAL]^{n+}$ where n=o, 1 and DA = dibasic acids e.g. Homophthalic acid (Hm), Diphenic acid (Dp) and L = 5,7,7,14,14- hexamethyl-1,4,8,11-tetraazacyclotetradeca-4, 11-diene. These complexes were characterized on the basis of elemental analyses, conductometric, magnetic, infrared, column and thin layer chromatography and electronic spectral studies. The present complexes are high spin species consistent with essentially octahedral stereochemisty with trans configuration.

Key words: Mixed ligand, Cyclic complexes, High spin species.

Pak J Sci Ind Res 1998 41 (5) 225-228

A Review of Feldspathic Raw Materials' Incorporation in Glass and Ceramics

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Feldspathic raw materials-feldspars and nepheline syenite are the essential ingredients of glass and ceramics compositions. In ceramics these materials exhibit valuable fluxing properties by lowering the melting point and bonding the other constituents together on solidification. The incorporation of these materials in the glass batch adds alumina to the glass and at the same time serves as a solvent for silica grains.

Key words : Feldspar, Glass, Ceramics

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VISCOSITY COEFFICIENTS AND ACTIVATION PARAMETERS OF LANTHANUM CHLORIDE IN PURE AND MIXED SOLVENTS AT DIFFERENT TEMPERATURES

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The measurement of viscosities of various solutions of Lanthanum chloride in pure water, pure methanol and different percentages of water-methanol i.e. mixed solvents has been made at different temperatures 298, 303, 308 and 313°K. The viscosity coefficients have been determined by using the Jone-Dole equation and found to vary with temperature and solvent compositions. The activation parameters have been determined in pure water, pure methanol and in 54% aqueous methanol at 298, 303 and 313°K. The salt has been found to be a structure breaker.

Key words : Viscosity coefficients, Jone-Dole equation, Activation parameters.

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DELIGNIFICATION OF KENAF (*HIBISCUS SABDARIFFA*) BY ORGANOSOLV PULPING PROCESS-*PART I.* ACETIC ACID

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(Received 4 December 1996; accepted 3 September 1998)

Kenaf (*Hibiscus sabdariffa)* was subjected to acetosolv pulping catalyzed by hydrochloric acid. The effect of various operational conditions like percent acid, percent catalyst and solid-liquor ratio on the percent yield and the quality of the resultant fractionated product was studied. Extensive delignification was achieved under a variety of operational conditions, leading to solid residues with lignin contents of less than 5%. The kinetics of the delignification process was also studied. The optimum pulping conditions established for this raw material were 95% acid, 0.25% catalyst and solid-liquor ratio of 1:12.5 in time of 120 mins giving a fractionated product having yield and α-cellulose contents of 54.5 and 85.7% respectively. Further, its fiber dimensions were found to be comparable to that of certain woods with mean fiber length and diameter of 1.506 and 0.0295 mm, respectively.

Key words: Kenaf, Acetosolv pulping, Delignification, Pulping conditions, Fiber dimensions.

Short Communications

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VOLATILE FLAVOUR COMPONENTS OF *ALLIUM SATIVUM* ESSENTIAL OIL FROM PAKISTAN

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Biological Sciences Section

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New Records of Coprophilous Fungi from Turkham, North Pakistan

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Sixteen genera and 24 species of Ascomycetous fungi are reported from Turkham on goat dung substrate. These fungi have never been reported earlier from this region. The species reported in this paper include: *Ascobolus immersus pers*; *Ascodesmis porcina* Seaver, *Coprotus granuliformis* (Cr. & Cr.) Kimbrough, *Chaetomium spirale* Zopf. *Chaetomium globosum* Kunze Fr., *Delitschia marchalii* Berl. and Vogl., *Kernia nitida* (Sacc.) Nieuwland, *Lophotrichus bartlettii* (Massee & Salmon) Mollach & Cain, *Podospora prethopodalis* Cain, *Sordaria fimicola* (Rob.) Ces. and de Not., *Saccobolus versicolor (Karst.)* Karst. *Sporormia fimetaria* De Not., *Sporormiella australis* (Speg.) Ahmed and Cain, *Sporormiella dakotensis* (Griff.) Ahmed and Cain, *Sporormiella minima* (Auersw.) Ahmed and Cain, *Sporormiella capybarae* (Speg.) Ahmed and Cain, *Sporormiella hexamera* Ahmed *et al*, *Sporormiella tetramera* Ahmed and Cain, *Sporormiella inaequalis* Ahmed and Asad, *Sporormiella intermedia* (Auersw.) Ahmed and Cain, *Thielavia variospora* Cain, *Tripterospora erostrata* (Griff.) Cain, *Zopfiella karachiensis* (Ahmed & Asad) Guarro and *Zygopleurage multicaudata* Mirza.

Key words: Coprophilous fungi, Turkham, Pakistan.

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INORGANIC ELEMENTAL CONCENTRATIONS OF WILD *CATLA CATLA* IN RELATION TO GROWTH

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Forty nine *Catla catla* samples of variable sizes caught from the River Chenab, Pakistan were studied for inorganic elemental concentrations in relation to body size. It was observed that the total quantity of elements i.e. sodium, potassium, calcium, magnesium, manganese, iron, nickel, copper, zinc and lead was found to increase isometrically with body weight. Whereas only sodium, potassium, magnesium, zinc and lead showed positive allometry and the remaining elements showed isometry with increasing length. Cobalt, chromium and cadmium were not quantifiable.

Key words: *Catla catla,* Inorganic elemental concentrations, Growth

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ECOLOGICAL ASSESSMENT OF RANGELAND VEGETATION IN SOUTHERN ATTOCK *PART I.* PHYTOSOCIOLOGY

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Phytosociological study was carried out over an area of 73780 ha rangelands in southern Attock. The objective of this study was to delineate the existing vegetation into dominant plant communities so as to monitor and maintain the health of these rangelands over time based on floral, edaphic and climatic requirements. Four ecological units were identified and vegetation and landuse map was prepared. Vegetation inventory of Summed Dominance Ratio (SDR) showed a total of 17 plant species in protected unit(sub-unit 1.1) and 18 plant species in unprotected unit (sub-unit 1.2) which were distributed among plant communities of *Chrysopogon montanus* and *Heteropogon contortus* respectively. Similarly, 11 plant species in protected unit(sub-unit 2.1) and 12 plant species in unprotected (sub-unit 2.2) were found among plant communities of *Acacia modesta, Acacia nilotica, Adhatoda vesica* and *Ochthochloa compressa,* respectivly. Overall the invader plant species, which were high in unprotected area were being replaced with desirable forage tree and grass species in protected areas.

Key words: Rangeland, Phytosociology, Summed Dominance Ratio (SDR).

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OCCURRENCE OF FISH EGGS (FAMILIES: ENGRAULIDAE AND CARANGIDAE) IN THE BACKWATER OF KARACHI HARBOUR

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(Received 9 August 1997; accepted 27 June 1998)

Fishes of the families Engraulidae and Carangidae are known to breed all along the coastline of Pakistan and their eggs and larvae drift in the mangrove areas. During the 13 months of sampling from Dec. 1992 - Dec. 1993, a total of 2979 fish eggs were collected from the mangrove area along the Karachi habour. 47 fish eggs belonged to families Engraulidae and Carangidae. These eggs were separated in three genera: *Thrissocles, Anchoviella* and Caranx. The study reports distribution and occurrence of eggs and their detail description.

Key words: Fish eggs, Engraulidae, Carangidae, Karachi harbour.

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SCREENING ELITE HYBRIDS OF COTTON *GOSSYPIUM HIRSUTUM L.*

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(Received 29 March 1995; accepted 31 August 1998)

Study on heterosis was carried out on 15 hybrid combinations involving eight *Gossypium hirsutum* L. varieties. Six hybrids showed significant differences in all types of heterosis for attributes like boll number and seed cotton yield per plant and one hybrid showed heterosis for boll weight. None of the hybrids showed significant increase over parents for sympodia per plant. The hybrid S-12 x CRIS-52 exhibited maximum heterosis over commercial cultivar (183.76%). The crosses S-12 x CRIS-52 and CRIS-7A NIAB-78 showed promising performance for the characters like boll number and seed cotton yield and are recommended to be included in breeding programmes to develop high yielding varieties/ hybrids.

Key words: *Gossypium hirsutum* L, Heterosis, Yield.

Technology Section

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High Molecular Weight Acid Phosphatase from Chicken Liver: Isolation, Purification and Characterization

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(Received 26 June 1996; accepted 25 November 1997)

High molecular weight acid phosphatase from chicken liver was purified by salt fractionation, gel filtration on Sephadex G-150 and by affinity chromatography on Sepharose 4B-L-Tartramic amide column. The purified enzyme moved as a single band. The molecular weight was estimated to be approximately 100 k.Da. by gel filtration on Sephadex G-100 and approximately 50 k.Da. by SDS polyacrylamide gel electrophoresis indicating dimeric protein. K_m against *p*-nitrophenyl phosphate and phenyl phosphate at pH 5.0 and ionic strength 0.15 were found to be 0.08 mM and 0.12mM respectively, while the V_{max} for these two substrates were 275 $Umin^{-1}$ mg^{-1} and 250 $Umin^{-1}$ mg^{-1} of protein respectively. The enzyme was strongly inhibited by phosphate, tartrate, vanadate and molybdate. The ideal substrates for the enzyme were 4-ethyl phenyl phosphate, 4-trifluoromethy-phenyl phosphate, α-naphthyl phosphate and *o*-phosphotyrosine in addition to *p*-nitrophenyl phosphate and phenyl phosphate. Other substrates were also hydrolysed but at slower rates.

Key words: Chicken liver, Acid phosphatase.