ISSN 0030-9885

Coden: PSIRAA 43(2) 73-136 (2000)

PAKISTAN JOURNAL OF SCIENTIFIC AND INDUSTRIAL RESEARCH

Vol. 43, No. 2
April 2000

Published bimonthly by
Scientific Information Centre
PAKISTAN COUNCIL OF SCIENTIFIC AND INDUSTRIAL RESEARCH
Karachi

Physical Sciences

Pak J Sci Ind Res 2000 43 (2) 73-82

PETROGRAPHY AND GEOCHEMISTRY OF KORA GYPSUM DEPOSIT, DAUDKHEL, DISTRICT MIANWALI

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(Received 6 November 1998; accepted 28 June 1999)

The Kora Gypsum Deposit (KGD) is present in the western Salt Range near Daudkhel in District Mianwali. Petrographic and geochemical studies of KGD have been made to evaluate the nature of deposit and characteristics of the depositional environment. The gypsum grades into Sakesar limestone of Upper Eocene age. It is inferred that KGD is a sulphate facies of Sakesar limestone, formed in a barred basin. Trace element analyses of gypsum and limestone show nearly similar distribution patterns, indicating same geochemical environment. The low Mg, poor Fe and absence of K from the gypsum samples indicate Deep Basin Deep Water (DBDW) condition. The presence of clay, high chalcophile elements (Zn, Cu and Ni) and sedimentary structures observable in the field also suggest a DBDW model. The thin section studies and geochemical investigations communicate that initially gypsum was precipitated either due to evaporation or mixing of different brines. Dehydration of gypsum into anhydrite occurred during Miocene due to thick succession of overlying Siwaliks. The Pliocene Himalayan tectonics caused uplifting of the area and subsequent erosion and removal of overburden brought these anhydrite beds to near surface conditions, where they were converted into gypsum due to rehydration from groundwater.

Key words: Gypsum, Petrography, Geochemistry, Depositional basin, Kora, Daudkhel.

Pak J Sci Ind Res 2000 43 (2) 83-89

PHYSICO-CHEMICAL ANALYSIS OF FERTILIZER INDUSTRY EFFLUENT AND ITS EFFECTS ON CROP PLANTS

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(Received 13 July 1998; accepted 7 July 1999)

This study comprised physico-chemical analysis of selected fertilizer effluent, evaluation of hazardous pollutants, their effects on crop plants and remedial measures. Effluent samples of selected phosphatic and nitrogenous fertilizer industries were collected, periodically. The samples were analysed for pH, conductivity, hardness, alkalinity, dissolved solids, suspended solids, chemical oxygen demand (COD), chlorides, sulphates, sulphides, phosphates, silica, chlorine, ammonia, calcium, magnesium and iron. Trace metals like arsenic, cadmium, chromium, cobalt, copper, lead, manganese, nickel, tin and zinc were also checked. Effects of these effluents on crop plants and vegetables were observed and remedial measures for the hazardous pollutants of these effluents suggested.

Key words: Fertilizer, Effluent, Crop plants.

Pak J Sci Ind Res 2000 43(2) 90 - 94

Iso-Propyl Formate Hydrolysis in Water and the Evaluation of Rate Constants

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(Received 9 August 1998; accepted 22 July 1999)

Emphasis has been placed on the data for the hydrolysis of *Iso*-propyl formate in neutral medium over the temperature range 303-343 K to illustrate the method, employing numerical integration and the criteria of least squares, for the evaluation of the first and the second order rate constants in Kirmann's equation by the sum of trapezoids. The values obtained for the second order rate constant k_1 (l mol^{-1} sec^{-1}) are compared with the values reported in the literature. The hydrolysis of *iso*-propyl formate involves alkyl-oxygen cleavage. A mini computer program on a 6502 12K, Acorn Atom computer has been designed for the evaluation of rate constants.

Key words: Esters, Hydrolysis, Rate constant, *Iso*-propyl formate.

Pak J Sci Ind Res 2000 43 (2) 95-98

ON SOME DISTRACTING BEHAVIOUR OF AUTOMATIC X-RAY DIFFRACTOMETER

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(Received 26 July 1998; accepted 7 August 1999)

Two distracting situations have been discussed which were faced while working with the automatic X-ray diffractometer, Siemens D-500C. These problems, appeared to be, in one case, the result of the climatic conditions and working environments in the laboratories, whereas the second one was found to arise due to the special impurity emitted by the X-ray tube.

Key words: X-ray diffractometer, Sintillation counters, Spectral impurity.

Pak J Sci Ind Res 2000 43 (2) 99-102

FACTORS AFFECTING CHROMIUM REMOVAL USING *SACCHAROMYCES CEREVISIAE*

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(Received 16 April 1999; accepted 16 August 1999)

The removal of chromium ions Cr(III) from aqueous solutions using *S cerevisiae* was studied. The influence of some factors affecting biosorption activity such as temperature, pH, weight of dried cells, concentration of Cr(III), time contact between biomass and metal and shaking were examined. Maximum uptake level of Cr (III) ions was attained by using 350 mg biomass and 100 µg Cr(III), in 0.2M phosphate buffer (pH 8.0), 25°C, shaking at 200 pm.

Key words: Biosorption activity, *S cerevisiae*, Chromium removal.

Pak J Sci Ind Res 2000 43 (2) 103-107

DELIGNIFICATION OF KENAF (*HIBISCUS SABDARIFFA*) BY ORGANOSOLV PULPING PROCESS. *PART-II.* FORMIC AND PROPIONIC ACIDS

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(Received 3 November 1998; accepted 24 August 1999)

Organosolv delignification of kenaf *(Hibiscus sabdariffa)* mediated by formic and propionic acids, catalyzed by hydrochloric acid, was evaluated. The effect of different variables like concentrations of acid and catalyst and charge ratios on the yield and quality of the delignified products alongwith the kinetics of delignification process was studied. It was, thereafter, established that optimum conditions of delignification of kenaf for these two acids were 80 and 90% concentration (w/w) of acid, 0.2% of catalyst, solid-liquor ratio of 1:12.5 and fractionation time of 120 and 90 minutes for formic and propionic acids, respectively. Furthermore, it was observed that propionic acid gives comparatively a better quality delignified product in good yield and takes lesser time as compared to the other aliphatic organic acids.

Keywords: Organosolv pulping, Kenaf, Delignification, Formic acid, Propionic acid.

Pak J Sci Ind Res 2000 43 (2) 108 - 113

TRAFFIC NOISE IN HYDERABAD CITY *PART I.* ROAD TRAFFIC NOISE

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(Received 3 March 1999; accepted 29 September 1999)

Traffic noise survey was conducted at 20 sites in different areas and localities in Hyderabad city and at each site noise data was collected continuously from 0800 to 2000 h .The data was analyzed for L_{A99}, L_{A90}, L_{A50}, L_{A10} and L_{A1}, and approximate values of L_{Aeq12h} were evaluated for each site. The results are discussed with reference to some criteria for community annoyance and means and ways to limit high-level traffic noise are suggested.

Key words: Noise pollution, Traffic noise, Hyderabad city.

Pak J Sci Ind Res 2000 43 (2) 114-117

COPOLYMERIZATION OF METHYL METHACRYLATE (MMA) AND BUTYL ACRYLATE (BA) AND POLYBLENDS WITH CHLORINATED RUBBER (CR)

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(Received 24 July 1998, accepted 14 October 1999)

Synthesis of MMA-Co-BA was accomplished at 60°C using benzoyl peroxide as initiator. It is observed that MMA and BA form copolymers in all monomeric ratios. Tensile properties and hardness were determined for the films prepared from the blends of chlorinated rubber and MMA-Co-BA. Tensile strength of the films increases as the amount of chlorinated rubber is increased. The increase in tensile strength might be due to intermolecular and intramolecular rearrangements of copolymer molecules with chlorinated rubber and an increase in the crosslinking density of the system. The rearrangement of copolymer molecules with chlorinated rubber also enhanced the elongation at break. The addition of copolymer and plasticizer make the films more soft and flexible.

Key words: Monomeric ratios, Tensile properties.

Pak J Sci Ind Res 43 (2) 118-122

MICROPROPAGATION POTENTIAL OF *POLIANTHES TUBEROSA* L BULBS, SCALES AND LEAVES

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(Received 27 March 1997; accepted 26 October 1999)

To enhance the rate of multiplication of *Polianthes tuberosa, in vitro* techniques were applied. The micropropagation potential of bulb and leaf tissues was explored. Twin scale and chip explants from the lower halves and single scale explants from the upper halves of the bulbs were cultured on MS medium supplemented with different concentrations of naphthalene acetic acid (NAA) and benzyl aminopurine (BAP). bulblet induction was pronounced on both twin scales and chips. Bulblet formation and gain in size was greater in the case of chips than in twin scales, indicating an influence of the size of the explant. Bulblet induction on single scale explants of tuberose bulbs was also observed. Leaf blade explants formed callus on MS medium supplemented with defined hormonal concentrations of BAP, *AA and Kin. Psuedoembryogenic bodies regenerated from the calli.

Key words: Polianthes tuberosa , Micropropagation, ; Bulblets, Psuedoembryogeny.

Pak J Sci Ind Res 2000 43(2) 123-126

ESTIMATION OF INDUCED SECONDARY METABOLITES IN CHICKPEA TISSUES IN RESPONSE TO ELICITOR PREPARATION OF SEAWEEDS

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(Received 11 May 1998; accepted 16 December 1999)

Disease response of plants in terms of induced browning and phytoalexin (induced secondary metabolites) production were recorded in the tissues of *Cicer arietinum* (Chick pea) treated with the High Molecular Weight Crude Elicitor Preparations, HMWCEP "Polysaccharides" of *Hypnea musciformis* (red algae), *Padina tetrastromatica* (brown algae) and *Ulva lactulus* (green algae). A UV-visible spectrophotometric method has been developed for the quantification of induced secondary metabolites with time.

Key words: Induced secondary metabolites, Phytoalexin, Elicitor activity, *Cicer arietinum,* UV Scan.

Pak J Sci Ind Res 2000 43 (2) 127-129

SEED HEALTH TESTING OF CUCUMBER (*CUCUMIS SATIVUS* L)

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(Received 4 December 1998; accepted 28 December 1999)

Using ISTA techniques, the seed-borne mycoflora of cucumber (*Cucumis sativus* L.) was studied. The blotter method was found to be the most suitable technique for detection of fungi in cucumber seed. Deep freezing method was preferable for the detection of *Fusarium* spp. A total of 18 genera and 33 species were isolated, of which 25 have not hitherto been recorded from seeds of cucumber in Pakistan.

Key words: Cucumber, Mycoflora, ISTA technique.

Short Communication

Pak J Sci Ind Res 2000 43 (2) 130-131

EFFECT OF SALINITY ON GROWTH AND CHLOROPHYLL CONTENT IN RICE

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(Received 16 February 1998; accepted 24 June 1999)

Technology

Pak J Sci Ind Res 2000 43 (2) 132-136

UTILIZATION OF AGRICULTURE WASTES. *PART I.* PRODUCTION OF FUNGAL PROTEIN FROM RICE AND WHEAT STRAWS

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(Received 28 July 1999; accepted 24 December 1999)

Agricultural waste of rice and wheat straws were studied for the production of protein and biomass. As these wastes have low protein contents an attempt is made to increase the protein and biomass content of these wastes so as to produce a better product for consumption as food. The studies were conducted using various media and various incubation periods. Some inorganic salts and molasses were added to improve the cultivation of fungi. *Aspergillus oryzae* produced the best results due to its rapid growth which minimized the chance of contamination. Seven days incubation gave the most favourable results in both the agricultural wastes. The maximum production of biomass (33.33%) with a protein value of 20% was obtained with 450 g of rice straw in media no. 2 whereas 400 g of wheat straw on 6 litres of medium produced the best results with 20% biomass and a protein value of 20%.

Key words: Agriculture waste, Fungal protein, *Aspergillus oryzae,* Protein rich feed.