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Physical Sciences Section

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MINERALOGY AND CHEMISTRY OF CLAYS FROM KHAIRPUR, SIND PROVINCE

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(Received February 12, 1981 ; revised April 10, 1983)

The present paper reports on the mineralogy and chemistry of clays collected from Ubban Shah and Allahjoria west mines of Khairpur area. Chemical, x-ray powder diffraction, differential thermal analysis and thermogravimetric analysis suggest that the samples are illite interstratified with some montmorillonite. Quartz, gypsum and some kaolinite are found in subordinate amounts. The clays are not suitable for commercial activation and utilization for the bleaching of oils.

TEMPERATURE DEPENDENCE OF THE REFRACTIVE INDEX INCREMENT OF CELLULOSE ACETATE IN ACETONE SOLUTION

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The refractive index increments of cellulose acetate in acetone are determined for three different concentrations and at ten different temperatures, using light of three different wave lengths. These are determined using Brice Phoenix Differential Refractometer. The values of slopes of the plots of refractive index increments versus temperature are in the range of $(2.70 \times 10^{-4} \text{ to } 6.32 \times 10^{-4} \text{ ml.g.}^{-1}) \text{ deg.}^{-1})$ and are in agreement with the values quoted for general case. These values decrease with the increase in concentration as from good to a poor solvent.

SOLANUM SPECIES AS A SOURCE OF STEROIDAL DRUGS

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(Received December 27, 1982)

Method for the quantitative estimation of steroidol alkaloids especially those from solanum species has been described. Solasodin contents of six species of solanum in leaves fruits and seeds of the plant are reported.

INTRODUCTION

Plant steroids are the main sources of corticosteroidal drugs of which the most important plants belong to genus *Dioscorea*. World requirement of these steroids are mostly

in their sugar components. The common aglycon is solasodine a nitrogen analogue of diosgenin. Solasodine can be used generally like diosgenin for the preparation of corticosteroid. Various species of solanum have been analysed in order to select the best variety, giving maximum yield of

MICROBIAL CHEMISTRY**Part IV. Isolation and Identification of the Metabolic
Products of *Aspergillus ustus* (Bainier) Thom and Church
NMR Studies of Cyclopaldic Acid**

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(Received December 11, 1982)

Aspergillus ustus grown on semi-synthetic medium has been shown to elaborate cyclopaldic acid, fumaric acid, succinic acid, ergos-terol, stearic acid, mannitol and a yellow solid which was resolved into seven crystalline compounds through preparative tlc. Additional evidence based on NMR is presented to show that cyclopaldic acid exists predominantly in the lactol Form I-a.

ARGENTIMETRIC METHOD FOR THE DETERMINATION OF AZINPHOS METHYL USING DICHLOROFLUORESCEIN AS INDICATOR

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(Received April 26, 1982)

Azinphos methyl is a non-systemic insecticide and acaricide of long persistence, chiefly effective against biting and sucking pests. It is mainly used in Pakistan on top fruit, cotton and citrus etc.

A method for the determination of Azinphos methyl has been developed. The method consists in hydrolysing azinphos dissolved in methanol at room temperature by sodium hydroxide in the presence of phenol and estimating O, O, dimethyl hydrogen phosphorodithioate with silver nitrate, using dichlorofluorescein as the indicator.

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PHYTOSOCIOLOGICAL STUDIES AROUND THE POLLUTED DISPOSAL CHANNELS OF INDUSTRIAL AREAS OF KARACHI

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(Received February 16, 1982; revised September 20, 1982)

Quantitative phytosociological studies of 13 stands were carried out alongwith soil analysis on the disturbed and polluted industrial areas of Sind Industrial Trading Estates (SITE) and Manghopir. Four associations were recognized on the basis of floristic composition, physiognomic similarity, importance value index and soil characteristics.

Short Communication

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PROSOPOL STRUCTURE: A RE-INVESTIGATION

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Short Communication

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**A NEW METHOD FOR THE PREPARATION OF METHYL-3 KETO-7 α , 12 α
DIHYDROXY-5 β -CHOLANATE**

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Biological Sciences Section

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SUSCEPTIBILITY OF WHEAT VARIETIES TO ZINC

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(Received November 11, 1980)

Several wheat varieties were grown under Zn stress and Zn supplemented conditions in green house pot trial to study the differential behaviour in dry matter production and Zn accumulation in plant tops. The varieties showed considerable differences in growth, Zn absorption, total Zn uptake, P/Zn and Fe/Zn ratios in the plants under Zn stress condition. The depression in yield due to Zn deficiency, however, was significantly negatively related to Zn concentration only and not to P/Zn or Fe/Zn ratios in the plant. Lyallpur-73 appeared more while Chenab-70 less susceptible to Zn stress condition in the soil.

EFFECT OF DIFFERENT NITROGEN LEVELS AND HARVEST STAGES ON THE YIELD AND QUALITY OF SORGHUM FODDER

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(Received October 14, 1981 ; revised November 10, 1982)

To determine the nitrogen utilization efficiency of sorghum fodder harvested at different growth stages, an experiment was conducted at the Agronomic Research Area, University of Agriculture, Faisalabad and it was observed that the height of the plant and number of leaves per plant increased significantly by the application of nitrogen over control. Similarly stages of harvesting differed considerably from one another in these respects. There was a linear increase in green fodder yield as the nitrogen rate was increased from 24 to 48 Kg/acre. Moreover it was observed that there was relative increase in protein and fat contents with the increase of nitrogen rate but these contents were considerably decreased when the crop was harvested 75 days after planting.

**CHEMICAL COMPOSITION OF *COLPOMENIA SINUOSA*
AS INFLUENCED BY SEASONAL VARIATION**

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(Received December 23, 1981)

A study on the effect of seasonal changes on the chemical composition of the brown algal species *Colpomenia sinuosa* showed that the variations of protein and amino acid content correspond with that of ash and its constituents. The maximal content of total lipids and mannitol were noted in April and November, respectively. The presence of the free monosaccharides glucuronic acid, galactose and xylose was observed in all seasons investigated. The maximum and minimum contents of these low-molecular weight carbohydrates were observed in November and April, respectively. Acid hydrolysates of the algal material, collected in different seasons, contained mannuronic, guluronic, glucuronic acids and their respective lactones as well as galactose, glucose, mannose, xylose and fucose. The proportions of these sugar residues in the algal material differed according to the season of collection.

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INFLUENCE OF NITROGEN ON THE YIELD AND N CONTENT OF RICE

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Technology Section

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POLYMERIZATION AND CHARACTERIZATION OF SEGMENTED POLYURETHANES

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(Received, September 5, 1980; revised, April 10, 1983)

A number of linear polyurethanes were prepared by using a variety of hydroxyl ended low molecular weight polymers, diisocyanates and diols. Dimethyl formamide was found to be the best solvent in the two shot solution polymerization technique. The NCO/OH ratio was kept at 1:1 in all the preparations and the polymers were precipitated from water.

After preliminary characterization for melting points, viscosities etc, the polymers were solution cast into thin films and were used for the measurement of tensile properties. The polymers from aliphatic diisocyanates gave a better set of tensile properties, as compared to those derived from aromatic diisocyanates. The nature of diol also plays an important role in determining the properties of polyether based polyurethanes. It has been observed that as the number of CH_2 units increases in diol there is considerable decrease in modulus and other tensile properties.

SUGAR-CANE PROCESSING AT THE VILLAGE LEVEL

Part I. State of Art Study

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(Received October 9, 1982)

The parameters of the sugarcane processing at the village level have been determined. It has been observed that time-lapse between harvesting and crushing is 12 hours at the village level as compared to 72 hours in case of big mills. The cane is crushed near the fields in the villages, while trucks, trolleys and bullocks carts have to be employed for transporting the sugarcane to the distant mills which causes 6-21% loss in weight. The villagers use crushers of different sizes which are worked by bullocks, tractors and motors. 90% of the total canes are crushed by bullocks. Juice % extraction varies from 50-65 and it depends upon a number of factors. The sugar factories extract 77 % juice through different processes. Juice is concentrated in mild steel open-pans having 144cm. diameter and depth as 28th cms. The capacity of the pan is generally 144 litres in the Punjab while it is 250 litres in the N.W.F.P. Bagasse is the major hand-fired fuel for burning in mono or di hearth clay-grate furnace.

TURBIDIMETRIC DETERMINATION OF SODIUM THIOSULPHATE

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(Received September 3, 1981)

A new method for the turbidimetric determination of sodium thiosulphate has been described. Selenium dioxide has been used as a reagent for producing very fine orange coloured turbidity which was measured with a colorimeter using filter No 44 in position. The method is reasonably sensitive, accurate and convenient to perform in an ordinary laboratory. Sulphite and sulphide do not interfere when present in a concentration of 2 and 10 μg respectively in a 1.0 mg sample of sodium thiosulphate. The interferences due to sulphate, chloride, calcium and lead have also been checked.

EFFECTS OF INORGANIC SALTS ON THE COPOLYMERIZATION OF VINYL AND ALLYL MONOMERS

Part-IV. Copolymerization of Acrylonitrile and Allyl Alcohol in the Presence of Some Inorganic Salts

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(Received December 23, 1981)

The thermal copolymerization of acrylonitrile and allyl alcohol in the presence of some inorganic salts like CoCl_2 , SrCl_2 , MnCl_2 , PtCl_6 and NiCl_2 without using any radical initiator was investigated. The accelerating effect of these salts was observed. The complexation in the case of acrylonitrile takes place through nitrile group of the monomer whereas in the case of allyl alcohol complex formation occurs on allylic group of the monomer. The inorganic salts act as chain transfer agents and do not appreciably change the reactivity ratios values of the monomers. The copolymerization mechanism is also discussed.