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Physical Sciences Section

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STUDIES IN HARMINE SERIES OF ALKALOIDS

Part II. Further New Derivatives of Tetrahydroharmine

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(Received January 9, 1983)

In connection with the studies of structure and activity relationship in the harmine series of indole alkaloids a number of new derivatives of tetrahydroharmine have been prepared. Furthermore, it was found during the course of these reactions that nitration of tetrahydroharmine derivatives (X) and (XI) through HNO_3/CH_3COOH under mild reaction conditions yields tryptamine derivatives (XIII) and (XIV) respectively through substitution of the nitro group at C-2 of the indole nucleus with ring opening.

REACTION OF ARYLIDENECYANOACETAMIDES WITH *p*-TOLYLTETRACHLOROPHOSPHORANE

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(Received June 28, 1980)

Arylidenecyanoacetamides react with *p*-tolyltetrachloro-phosphorane in refluxing carbon tetrachloride to give N-(arylidenecyanoacetyl)p-tolyl phosphonimidic dichlorides. The structural assignments of the products were based on IR and chemical reactions.

Pakistan J.Sci.Ind.Res., Vol. 26, No.2, April, 1983

MINERALOGICAL AND SOME OTHER PROPERTIES OF CHROMITE FROM MALA KAND AREA

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(Received December 23, 1981)

A study has been made on Chromite from Malakand area. Its geology, chemical composition, X-ray diffraction, differential thermal analysis, petro-graphic analysis and specific gravity are presented. The associated minerals are antigorite, chrysotile, olivine, chlorite, iddingsite and serpophite. Chemically the ore contains 38.85 to 53.15% Cr_2O_3 with permissible amount of silica and iron oxide for the manufacture of chrome and chrome-magnesite refractories.

Pakistan J.Sci. Ind. Res., Vol. 26, No. 2, April 1983

DISTRIBUTION OF SEA BED MATERIAL ALONG THE COASTAL AREA OF KARACHI DURING THE SOUTH-WEST MONSOON

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(Received March 27, 1982)

Waves breaking at an angle with the shoreline set up a longshore current, which is capable of carrying large amounts of sediment. If the flow of sediment is impeded, the equilibrium of the beach is disturbed and silting or eroding will follow. The distribution of sea-bed material during south-west monsoon (April to September) have been studied by collecting weekly samples at six stations along the belt from cape Monze to Manora Break Water. The study reveals that wave energy is enough to erode and move the sand along the coast.

Pakistan J.Sci.Ind.Res., Vol.26, No.2, April 1983

E.S.R. BEHAVIOUR OF Mn^{2+} IN CaO

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(Received March 27,1982; Revised October 31, 1982)

The electron spin resonance spectrum of Mn^{2+} in single crystal CaO has been examined at both 9 GHz and 30 GHz over the temperature range 273K to 90K; the manganese concentration was 280 ppm. The fine structure lines overlapped, giveing a six-line spectrum in which the experimental peak to-peak derivative width of the M = +½ to M = –½ transition was (1.7 ± 0.1) mT. The predicted angular variation of linewidth for this manganese concentration has been claculated from Van Vleck's dipolar theory and comparison shows that the observed linewidth is about twenty five times less than expected. Lineshape analysis, taken in conjunction with previously reported data, confirmed that the line widths are concentration dependant and showed that (at 2800 ppm Mn) the lineshape was Lorentzian.

Pakistan J. Sci. Ind. Res., Vol. 26, No. 2, April, 1983

DIFFERENTIATION OF KOREAN AND SIBERIAN GINSENG EXTRACTS BY THIN-LAYER CHROMATOGRAPHY

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(Received May 9, 1982)

Thin-layer chrmatographic profiles derived from authentic samples of *Panax ginseng* C.A. Meyer and *Eleutherococcus senticosus* (Rupr. et Maxim). Maxim. are presented as an aid for the analyst to distinguish between samples marketed as Korean and Siberian Ginseng.

Short Communication

Pakistan J.Sci.Ind.Res., Vol. 26, No. 2, April 1983

ESTIMATION OF SULPHIDE IN PRESENCE OF OTHER SULPHUR COMPOUNDS

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(Received August 30, 1982)

Short Communication

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RELATIONSHIP BETWEEN CHEMICALLY EXTRACTABLE ZINC AND L VALUE IN ACID SOILS

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Biological Sciences Section

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NITROGEN BALANCE IN HUMAN SUBJECTS AS INFLUENCED BY CORN BREAD SUPPLEMENTED WITH PEANUT AND CHICKPEA FLOURS

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(Received August 18, 1980; Revised , November 18, 1982)

Results are presented on the nitrogen balance in six young human subjects fed corn bread alone and supplemented with either 10% peanut flour or 10% peanut-chickpea flour (1:1). The diets were iso-caloric (2800 k.cals/day) and iso proteic (10gN/day). Corn bread provided 70% of the protein intake and the remaining was derived from other vegetable surouces. The average nitrogen balance of the subjects fed unsupplemented corn bread (-0.005gN/day) was significantly improved ($P < 0.01$) when corn was supplemented with either 10% peanut flour (+0.025gN/day) or 10% of 1:1 peanut-chickpea flour (+0.045gN/day). These results showed that supplementation of corn with peanut and chickpea flours is desirable for raising the nutritional standard of the local rural population whose staple diet mainly consists of corn bread.

Pakistan J.Sci.Ind.Res., Vol. 26, No. 2, April 1983

NUTRITIONAL AND ORGANOLEPTIC EVALUATION OF WHEAT BREAD SUPPLEMENTED WITH PEANUT FLOUR

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(Received , December 14, 1980; Revised , Spetember 19, 1982)

In order to prepare a nutritive and acceptable bread, wheat flour was supplemented with 10, 20 and 30% peanut flour. The proximate composition, nutritive value and organoleptic characteristics of the breads prepared from these flours were studied. It was found that the protein content of the breads increased from 12.50 to 25.0% with supplementation. The PER and NPU values were significantly increased over control by all leve of peanut flour supplement. The bread containing 20% peanut flour was best with respect to PER, NPR and organoleptic evaluation.

Pakistan J.Sci.Ind.Res., Vol. 26, No.2, April 1983

SOURCES OF CONTAMINATION DURING THE COMMERCIAL HANDLING OF FISH

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(Received , October 28, 1981; revised , January 21, 1983)

All probable sources of bacterial contamination during the commercial handling of fish such as ice used for chilling fish, the deck and hold of fishing vessel and the floor of the auction hall were examined for total bacterial counts and coliform and faecal coliforms Most Probable Numbers (MPN).

All the surfaces examined were found heavily contaminated with bacteria especially those of faecal original. Ice which is taken from the harbour for chilling the fish on board was found to contain lesser number of total bacteria and the organisms of faecal origin as compared to the ice brought back with the catch (old ice). Methods to prevent such contaminations are discussed.

Pakistan J.Sci.Ind.Res., Vol. 26, No.2, April 1983

MINERALIZABLE NITROGEN AS AN INDEX OF SOIL NITROGEN AVAILABILITY

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(Received , March 27, 1982)

Ammonium N released by oxidation with two concentrations of acid permanganate extraction solution was measured in 10 soils. Ammonium N released by 0.1 $\underline{N}$ $KMnO_4$ in 1 $\underline{N}$ H_2SO_4 significantly correlated with the N uptake by wheat plants as well as with the amount of mineral N released during an incubation test.

The results of the study bring out the usefulness of a simple soil test for mineralizable N, an index of N availability.

Technology Section

Pakistan J.Sci.Ind.Res., Vol.26, No.2, April 1983

THERMAL CONDUCTIVITY OF SOME HIGH TEMPERATURE POLYMERS

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(Received , November 12, 1980; Revised October 20, 1982)

The thermal conductivity of polymers at high temperature were determined by flash method. It indicated the rate of conduction of heat away from the surface in contact and was estimated at maximum temperature. The pre-polymers of polyquinazolinedione, and polyquinazolones were prepared and coated on stainless steeel substrate. The transient time for all of the polymers were measured from their curve history and from the results of the computer, thermal conductivity were determined. These were compared with polyphenylene sulphide. It was concluded that the thermal conductivities can be related to interatomic binding forces. The materials resemble that of the solid state material like graphite.

Pakistan J. Sci. Ind. Res., Vol. 26, No. 2, April 1983

DEVELOPMENT OF LOW TEMPERATURE CLAY BONDED GRAPHITE CRUCIBLES

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Low temperature clay bonded graphite crucibles have been developed from Ceylone graphite. The exact firing technique has been evolved to control the oxidation of graphite crucibles. A glaze has also been developed which assists in the control of oxidation of graphite crucibles.

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EFFECT OF TOXIC CHEMICALS ON CITRIC ACID PRODUCTION BY *ASPERGILLUS NIGER*

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(Received , January 13, 1982)

Citric acid fermentation of beet molasses by locally isolated cultures of *Aspergillus niger* was studied by surface culture method in one litre conical flasks. Effect of the addition of metabolic inhibitors (0.5-4% v/v) such as methanol, ehtanol, n-propanol. n-butanol, chloroform orcarbon tetrachloride, was studied on spore germination, mycelial growth and citric acid production. Of all the toxic chemicals, methanol showed least inhibition. The citric acid formation decreased in the order of ethanol, chloroform, n-propanol, n-butanol and carbón tetrachloride, The morphological changes occurring in the mould were very senstive to alcohols. The mould morphology was chagned into gelatinous mat of mycelium without black sporulation in the presence of n-propanol. However, a beaded mycelial mat with little black sporulation with n-butanol. The addition of ethanol slightly influenced the mould growth. In control cultures, however, the mycelial mat was uniform with white base and sufficient black sporulation on the surface.