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Physical Sciences Section

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MODELLING OF IONIC EQUILIBRIA IN ZINC SULPHATE – SULPHURIC ACID SOLUTIONS

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(Received May 11, 1991; revised September 23, 1991)

A mathematical model is developed for the ionic equilibrium of zinc sulphate – sulphuric acid aqueous solution, taking into account the effect of ionic strength. The model is reduced to a quadratic equation in the bisulphate ion and zinc ion. Results of this analysis indicate that ion interactions can significantly change the ionic concentration of the solutions which could lead to errors with evaluation of data on zinc extraction kinetics or equilibrium. The operating line between hydrogen ion and zinc ion concentration is necessary in the analysis of equilibrium and kinetic data in the liquid-liquid two phase extraction system. It is shown that results simulated with the developed model are in good agreement with experimental data.

Key words: Ionic equilibria, Zinc, Hydrogen ions, Ionic strength.

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GEOCHEMICAL STUDIES OF LAMBIDOGI (HAZARA) PHOSPHATES, PAKISTAN

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(Received September 4, 1989; revised August 17, 1991)

Petrological and geochemical data of Lambidogi phosphorites of Hazara (NWFP) have been described and discussed. The early Cambrian phosphorite deposits of Lambidogi (Hazara) occur as discontinuous outcrops and in the form of lenses. These are hosted in the dolomite of the Abbottabad Formation. Texturally Lambidogi phosphorites are of two types - microphorites (finely crystalline anthigenic mud) and oval shaped pelletes ranging in size from 0.2 to 3 mm. Mineralogically these phosphorites have been identified generally as hydroxylapatite and fluorapatite. X-ray diffraction, infrared spectral studies, Differential thermal and thermogravimetric and Chemical analysis have been carried out on Lambidogi phosphorites. These phosphorites are of high grade ($P_2O_5 = 37.85 \pm 1.20$) with low SiO_2 (0.89 ± 0.83) and MgO (0.62 ± 0.30) contents. R_2O_3 contents ($Al_2O_3 = 1.93 \pm 0.26$; $Fe_2O_3 = 2.62 \pm 0.09$) are also within the desirable limits for using the Lambidogi ore in manufacturing phosphatic fertilizers.

Key words: Geochemistry, Phosphorites, Hazara.

INTRODUCTION OF ACID LABILE GROUPS AT GLYCOSIDIC CENTRES IN SUGARS AND STUDY OF THEIR MOBILITIES

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(Received September 8, 1990; revised September 14, 1991)

Allyl α -D-glucopyranoside prepared by the conventional method, was methylated and then the allyloxy group was isomerised into the prop-1-enyloxy group. Then by the mild acid hydrolysing conditions this group was converted into hydroxyl group.

Key words: Mobilities, Acid labile groups, Glycosides.

DEGRADATION OF DIAZINON IN SOILS

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(Received January 14, 1991; revised August 11, 1991)

A silty clay acid soil was treated with diazinon by 30, 300 and 3000 ppm levels at field capacity, air-dry moisture conditions, and incubated for 200 days under laboratory conditions. The residues were determined after 0, 10, 40, 80, 120, 160 and 200 days of incubation. The degradation of diazinon was rapid at field capacity moisture levels wherever the rate was very slow in air-dry soils. With high dosages, the compound persisted longer in both soil conditions. The fate was linear and are well fitted to the regression lines.

Key words: Degradation, Incubation, Residues.

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MINERALOGY AND CHEMISTRY OF EOCENE SHALE FROM MARGALLA RANGE, NEAR ISLAMABAD, PAKISTAN

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(Received May 26, 1990; revised August 24, 1991)

Mineralogy, derivatography and chemical analysis of twenty-three shale samples collected from Margalla range near Islamabad is presented. The minerals identified are quartz, illite, chlorite, feldspar, pyrite, calcite and kaolinite. Commercial use of the resource is also suggested.

Key words: Mineralogy, Kuldana shale, Islamabad.

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INTRODUCTION OF ALKALI LABILE GROUPS AT GLYCOSIDIC CENTRES IN VARIOUS SUGARS AND STUDY OF THEIR RATES OF HYDROLYSIS

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(Received September 8, 1990; revised September 14, 1991)

p-Nitrophenyl L-rhamnopyranoside (2) and *p*-nitrophenyl- α -D-mannopyranoside (4) were prepared and each was subjected to alkaline hydrolysis. After 96 hrs, 80% hydrolysis was observed for rhamnopyranoside whereas 65% was observed for the mannopyranoside.

Key words: Hydrolysis of *p*-nitro phenyl, Glycosides.

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ALKANES AND ALCOHOLS IN CASSIA SEED OIL

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(Received November 13, 1990; revised July 14, 1991)

Three species known as *Cassia absus*, *C. fistula* and *C. occidentalis* of the family Leguminosae contain non-saponifiable material (1.8%), (1.6%) and (1.2%) respectively which on further separation showed hydrocarbons (43.1%), (42.3%), (51.2%) in addition to alcohols (41.3%), (39.2%), (30.9%) and unidentified material (15.6%), (18.5%), (17.9%) respectively. The hydrocarbons ($C_{18:0}$ — $C_{32:0}$) and alcohols ($C_{12:0}$ — $C_{28:0}$) were identified and characterized by the application of Chromatography and spectrophotometry.

Key words: Hydrocarbons, Fatty alcohols, Cassia species.

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SYNTHESIS AND REACTIONS OF 4-ARYLIDENE/OR (HALOPHTHALYLIDENE)-2-ARYL- Δ^2 -OXAZOLINE-5-ONE WITH SOME NUCLEOPHILES

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(Received July 28, 1990; revised September 4, 1991)

The behavior of oxazolone derivatives (I) and (II) toward some nitrogen, oxygen and carbon nucleophiles has been described.

Key words: 4-Arylidene oxazolone, Halophthalylidene oxazolone and Heterocyclic nitrogen compounds.

Biological Sciences Section

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TEMPERATURE EFFECTS IN THE BIOSYNTHESIS OF FATS AND FATTY ACIDS OF *CANDIDA UTILIS*

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(Received January 3, 1991; revised August 4, 1991)

The influence of temperature on the growth, lipid production and fatty acid composition of *Candida utilis* is discussed. A decrease in growth temperature from 30-15° has been shown to result in increased lipid formation and higher ratio of linoleic acid to oleic acid. An increase in lipid unsaturation at low temperature and its decrease at high temperature has been observed as the dominant response.

Key words: Biosynthesis, *Candida utilis*, Unsaturation, Glycolipids, Phospholipids.

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SHAKE FLASK STUDIES ON THE PRODUCTION OF RAW STARCH HYDROLYZING AMYLOLYTIC ENZYMES BY *ASPERGILLUS NIGER* PCSIR-10

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(Received February 12, 1991; revised September 24, 1991)

Raw starch hydrolyzing amylolytic activity, produced by *Aspergillus niger* PCSIR-10, in the shake flask was investigated. The activity in the basal medium was 0.32 IU/ml and it increased to 6.0 IU/ml when the medium was supplemented with either corn-steep liquor (CSL), or corn starch or metal ions such as calcium and magnesium. The optimum pH, temperature and fermentation period were 3.5, 30° and 48 hrs, respectively.

Key words: Raw starch, Gelatinised, Saccharifying.

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PRELIMINARY STUDIES ON FORMULATION AND BIOLOGICAL EVALUATION OF SUPPLEMENTAL DIET FOR *PENAEUS MONODON* AND *METAPENAEUS MONOCEROS*

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(Received January 13, 1991; revised August 26, 1991)

Four compounded supplemental diets (A to D) were formulated using locally available natural raw materials. The feed trials were made on juvenile *Penaeus monodon* and *Metapenaeus monoceros*, respectively. The feeds were assessed on the basis of their survival, growth and feed conversion ratios (FCR). Protein contents of the diet ranged from 19-36%. Major protein sources were fish meal, shrimp meal and blood meal. Diet A and D gave good growth and the best FCR. During a period of 6 weeks juveniles of *P. monodon* fed diet 'A' showed a gain of 60gm and fed diet D 68.5gm with FCR values of 1.6 and 1.7, respectively. In *M. monoceros* weight gain in shrimps fed diet A was 31.5gm and in shrimps fed diet D was 38.5gm with FCR values of 1.9 and 1.6, respectively.

Key words: Formulation, Supplemental diet, *P. monodon* and *M. monoceros*.

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STUDIES ON THE FIXED OIL OF THE SEEDS OF *ALBIZIA ODORATISSIMA* , *Part- IV*

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(Received, December, 9, 1990; revised July, 14, 1991)

A fixed oil to the extent of 5% extracted from the seeds of *Albizia odoratissima* has been studied with respect to its physico-chemical properties, lipid fractions and fatty acid composition. The oil is found to contain capric (1.09%), Lauric (1.07%), myristic (2.63%), palmitic (22.55%), stearic (6.85%) arachidic (3.86%), benhenic (7.17%), lignoceric (1.07%), oleic (24.01%) and linoleic acid (29.70%). Vitamin A is found to be 24 I. U. while Vitamin D 2 I.U.

Key words: Fixed oil, Physico-chemical properties, Lipid fractions, Fatty acid composition.

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VEGETATIVE AND REPRODUCTIVE RESPONSES OF WHEAT TO SUCCINIC ACID, 2,2-DIMETHYL HYDRAZIDE (ALAR)

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(Received September 2, 1982; revised August 18, 1991)

Wheat seeds, cv.SA-75, were treated with 4 concentrations, 2000, 2500, 3000 and 3500 ppm succinic acid 2, 2-dimethyl hydrazide (Alar). Their subsequent growth in field plots was investigated from 8 harvests taken at fortnightly intervals from Jan. 5 to April 15. Alar depressed plant height and reduced leaf area equally at all concentrations but had no effect on leaf number or dry weight of roots, shoots or of grain. The number of grains per spike, length of spike and number of spikelets per spike were increased at 2000 ppm but there was no effect of treatment of grain yield.

Key words: Wheat seeds, Succinic acid, 2, 2-Dimethyl hydrazine.

Short Communication

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***In Vitro* Screening of Sorghum Commercial
Varieties against Grain Smut of Sorghum
(*Sphacelotheca sorghii* Link)**

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(Received April 2, 1991; revised September 4, 1991)

Technology Section

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OXALIC ACIDS AS A TRAPPING AGENT IN CONWAY MICR-DIFFUSION AND STEAM DISTILLATION METHODS FOR TOTAL VOLATILE BASIC NITROGEN (TVB-N) AND TRIMETHYLAMINE NITROGEN (TMA-N) ANALYSIS AS QUALITY INDICATORS OF FISHERY PRODUCTS

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(Received September 12, 1990; revised September 21, 1991)

A new trapping agent has been tested in steam distillation and Conway microdiffusion methods to estimate the TVB-N and TMA-N. Similar results were obtained when oxalic acid (0.004%) was compared with boric acid (2-3%). Merits of oxalic acid as trapping agent in steam distillation and Conway microdiffusion methods are discussed.

Key words: Total volatile basic nitrogen (TVB-N), Trimethylamine nitrogen (TMA-N), Oxalic acid, Boric acid.

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STUDIES ON THE PREPARATION AND COMPOSITION OF DEHYDRATED GUAVA BEVERAGE BASE

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(Received November 25, 1990; revised September 18, 1991)

Locally produced guava fruit has been subjected to hot air dehydration laying emphasis on the preservation of flavour and nutrients. The dry guava powder-guava beverage base (GBB) yielded good flavouring drink when mixed with suitable amount of water. Shelf life assesment was also made. The dry (GBB), fresh as well as one year old sample, and the drink made from it, were analyzed for nutritional and other constituents like moisture, dry matter, ash, sugars, soluble pectin, ascorbic acid and minerals such as Ca, Mg, Na, K and P and comparison made with fresh fruit.

Key words: Guava, Dehydration, Powdered beverage base, Nutrients, Minerals.

Short Communication

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**Growth and Yield of Sunflower Varieties as
Influenced by Row Spacings**

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(Received May 25, 1989; revised May 15, 1991)

Sunflower (*Helianthus annuus* L.) is an important oil