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Physical Sciences Section

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BIOEQUIVALENCE STUDIES OF FIVE DIFFERENT BRANDS OF ERYTHROMYCIN TABLETS

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(Received March 3, 1981)

Bioequivalence studies of five different brands of erythromycin tablets through urinary excretion of active drug in healthy human subjects were conducted. Balance incomplete block design was employed and standard statistical techniques were used to detect any significant difference between multivariate and univariate characteristics. The urinary excretion data revealed that all the five brands are almost equally bioavailable and no difference is present at 0.05 level of significance.

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REACTION PRODUCTS FROM NITROUS ACID DEAMINATION OF L(+) ALANINE METHYL ESTER HYDROCHLORIDE IN ACETIC ACID

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(Received July, 1977; revised December 1981)

Deamination of L-(+)-alanine methyl ester or of its acid salts with sodium nitrite in acetic acid gave substitution products predominantly with retention of configuration. Angles of optical rotation under varying conditions and added salts have been recorded. The present composition of substitution and elimination products has been studied followed by a discussion on the results. An ion-pair mechanism has been proposed for the reaction.

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STUDIES ON THE AUTOLYTIC SPOILAGE OF TROPICAL SHRIMP (*PENEAUS MERGUIENSIS*)

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(Received June 1, 1980)

It has been found that the process of spoilage of tropical shrimp is accompanied with oxidation and saturation of different groups and double bonds. Dehydrogenase activity which is negligible in fresh shrimp increases, whereas the concentration of acetylcholine hydrochloride falls progressively during spoilage. No direct role of trypsin in the spoilage could be confirmed. The possible mechanism of the autolytic spoilage in the shrimp (*Peneaus merguiensis*) in the light of the above findings is discussed.

EXTRACTION OF LEAD (II) BY TRILAURYLAMMONIUM BROMIDE

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(Received September 24, 1980)

Two-phase emf titrations were performed to study the mode of extraction of lead (II) by trilaurylammonium bromide, BHB₃, dissolved *o*-xylene from 5.0 M Br₂, 0.10 M (H) aqueous medium at 25 ± 0.2°. Assuming ideal behaviour of the organic phase experimental data were analysed by equilibrium law. Best fit to the data was obtained by assuming the presence of complexes BH(PbBr₃), $K_{1,1} = (1.93 \pm 0.15) M^{-3}$; (BH)₂(PbBr₄), $K_{1,2} = (1.14 \pm 0.04) \times 10^{-2} M^{-4}$, and (PbBHB₃)₃, $K_{3,3} = (3.58 \pm 0.28) \times 10^{-11} M^{-11}$. Aggregates of the salt BHB₃, which are normally present in the organic phase do not play any significant role in the extraction of Pb(II) from the aqueous phase.

EFFECT OF INCUBATION ON SODIUM-BICARBONATE SOLUBLE PHOSPHORUS IN SOILS UNDER DIFFERENT MOISTURE AND PHOSPHORUS FERTILITY CONDITIONS

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(Received October, 1980)

The effect of incubation on NaHCO_3 -soluble phosphate in two major soils of Bangladesh treated with water-soluble phosphate and incubated under different moisture saturations have been studied in a pot experiment. Available P recorded sharp rise due to the application of TSP both in RBT (Madhupur) and NCDGF (Digarkanda) soils after 1 day incubation. Then it showed a continuous and great decrease with the increase in incubation time up to 440 days, the rate of decrease being more noticeable in pots treated with TSP. Higher moisture saturation caused in most of the pots greater recovery of the native and added P into NaHCO_3 -extractable P in both the soils. The changes in pH of the soils during incubation were less and appeared not to influence markedly on the dynamics of NaHCO_3 -soluble P.

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A MODEL FOR GOLD INTERFACE STATES IN GOLDDOPED SILICON/SILICON-DIOXIDE STRUCTURES

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(Received May, 1979)

A chemical-bond model for the formation of the gold states at the silicon/silicon-dioxide interface is suggested. For the analysis of the gold states at the interface, a three layer model of a real surface is employed.

Gold forms Au - Si intermetallic compound, when diffused into silicon from the backside of the device, and has negative charge character at the silicon/silicon-dioxide interface. But when gold diffused in through the oxide that is from the front side of the device it forms silicate compound and gold acts as a positively charged entity at the interface.

KINETIC STUDIES AND PREDICTION OF SHELF LIVES OF COMMERCIAL TABLETS OF ASCORBIC ACID UNDER DIFFERENT CONDITIONS

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(Received June 1, 1980)

A detailed kinetic study has been undertaken on seven different commercial samples of ascorbic acid tablets stored at 25^o, 40^o and 45^o in the absence of humidity to determine the shelf lives and activation energies. The shelf lives of these samples have also been evaluated at 40^o and 45^o in the presence of humidity.

Short Communication

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EFFECTS OF INDUSTRIAL WASTE EFFLUENTS ON THE SEEDLING GROWTH OF SOME COMMON PLANT SPECIES

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(Received April 16, 1981)

INCIDENCE OF TYPHLOCYBINE LEAFHOPPERS ON VEGETABLE AND FRUIT PLANTS IN BALUCHISTAN (PAKISTAN) 1979

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(Received February, 1981)

A general survey of leafhoppers of fruit and vegetable plants of Pakistan, partly carried out in Baluchistan during 1978, indicated that nearly 25 typhlocybinae species infested some of our important plants. A more organised survey was carried out during 1979 in Baluchistan in seven localities including Quetta, Sariat, Urak, Kuchlak, Mastung, Pishin and Loralai. As a result 756 samples of leafhoppers belonging to seven important species on seven fruit plants and eleven vegetable plants were studied. *Empoasca punjabensis*, *Edwardsiana quettensis*, and *Empoasca decedens* turned out to be more important on mulberry, muskmelon, apple and cherry. The host plants were observed much heavily infested by leafhoppers in some areas than it appears from means. Similarly *Amrasca devastans* and *Empoasca punjabensis* infested okra, luffa, moong and other vegetable plants more seriously.

Technology Section

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CHARACTERISTICS OF LAGARBAN PHOSPHATE ROCK FOR THE MANUFACTURE OF PHOSPHORIC ACID BY DIHYDRATE PROCESS

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(Received February 28, 1980)

Characteristics of Lagarban phosphate rock were studied with a view to assess its suitability for the manufacture of phosphoric acid through dihydrate process. Data obtained from bench scale tests are presented. In spite of high silica, iron, aluminium, magnesium oxide, carbonate and organic matter, slow reactivity and low $\text{CaO}/\text{P}_2\text{O}_5$ ratio, it is possible to produce phosphoric acid of 25 - 26 percent P_2O_5 concentration from Lagarban rock.

THE DETERMINATION OF DIFFUSION COEFFICIENT OF CERTAIN LIQUIDS IN AIR

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(Received October 29, 1980)

The diffusion coefficients of certain high molecular weight liquids having low vapour pressure in air have been determined by a natural convection method. It was found that the diffusion coefficients of ortho-dibromobenzene and ortho-dichlorobenzene at 25^o and 760 mm Hg were $(4.0 \pm 0.5) \times 10^{-6}$ and $(8.0 \pm 0.5) \times 10^{-6} \text{ m}^2/\text{s}$ respectively.

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DRY MAGNETIC SEPARATION OF MAGNESITE FROM FINE FRACTION OF SANTIYE MAGNESITE REJECTS*

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Magnetic concentration study on a fine fraction of hand picked santiye magnesite rejects left in a sink-float operation has been carried out. The fines (minus 0.5 mm) were subjected to high intensity dry magnetic separation to recover magnesite from serpentine gangue. By fixing various parameters of magnetic separator and depending upon the extent of silica ranging from 3.0 to 18.0% in the samples, various grades of magnesite concentrate were obtained.

Based on experimental data some standard graphs have been presented which may be applicable for predicting the suitability of magnetic separation of SiO_2 gangue from calcined magnesite or the natural ore.

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ELECTRODEPOSITION OF METALS IN AGITATED BED PARTICLE ELECTRODES*

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(Received March 1979)

Polarization phenomena associated with the use of an agitated bed of particles as an electrode for metal deposition were studied. The concentration polarization of this type of electrode is much smaller than that occurring at a fixed or moving electrode surface. Agitated particle electrodes can be used to electrowin copper from solutions over a wide range of concentration and at current density up to $1,000 \text{ A/ft}^2$ of bed cross section.

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COAL PREPARATION IN CHINA*

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Biological Sciences Section

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EFFECT OF SPORE- δ -ENDOTOXIN OF *BACILLUS THURINGIENSIS* ON THE DEVELOPMENT OF CORN EARWORM, *HELIOTHIC ARMIGERA* (Hubn)

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(Received January 12, 1981)

A detailed study on rearing of *Heliothis armigera* (Hubn) on artificial diet containing various concentrations of *Bacillus thuringiensis*- δ -endotoxin spore complexes of HD-1-S-1971 and native strain No. Bt-145, was conducted. The larval period, larval mortality and pupal mortality increased with increase in concentrations of the toxins. Pupation percentage was inversely proportional to the concentrations of toxin. The pupal weight and pupal length of the pupae treated with 10 and 20 μ g conc. of HD-1-S-1971/ml diet were reduced accordingly as the concentration increased. All experiments were carried out at temperature ranging from 75 - 91°F.