

Physical Sciences Section

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DISPERSION OF A SOLUTE IN MAGNETOHYDRODYNAMIC CHANNEL FLOWS

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(Received August 7, 1974; revised December 5, 1974)

Abstract. The dispersion of a solute in magnetohydrodynamic channel and Couette flows are considered. The effective Taylor diffusivities of the solute are calculated. It is observed that in both cases the effective diffusivity is a decreasing function of the Hartmann number.

N-PHOSPHORANYLIDENE SULPHENAMIDES

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(Received July 30, 1974; revised September 28, 1974)

Abstract. *N*-Phosphoranylidene sulphenamides were obtained by the reaction of dibromotriphenylphosphorane with sulphenamides and also by the reaction of hydrazoic acid=triphenylphosphineimine complex with sulphenyl chlorides, where the sulphenyl aromatic residue was substituted with an electro-negative group.

N-Phosphoranylidene sulphenamides on photolysis did not give the expected nitrenes but instead a low yield of disulphides and good yield of triphenylphosphine were obtained.

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TRITERPENOID FROM BETULA UTILIS— ISOLATION AND STRUCTURE OF KARACHIC ACID†

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(Received August 8, 1974; revised September 28, 1974)

Abstract. Karachic Acid—a substance isolated from the bark of *Betula utilis*—has been shown to be 3 β -hydroxy-6 α -acetoxyleanoic acid—a new triterpenoid of the oleanoic acid family.

DEOXYGENATION OF AROMATIC N-OXIDES WITH SULPHUR MONOCHLORIDE

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(Received July 4, 1974; revised September 28, 1974)

Abstract. *N*-Oxides of pyridine, quinoline and their derivatives were prepared. The *N*-oxides were reduced with sulphur monochloride to give their parent bases. The yields of the deoxygenation are good.

HARNED/ÅKERLÖF EQUATIONS AND THE SOLUBILITY OF NaCl IN HCl-WATER SYSTEM

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(Received June 5, 1974; revised September 4, 1974)

Abstract. The solubilities of sodium chloride in water in the presence of hydrochloric acid have been calculated with Akerlof equation and these values are compared with experimental results. B_c and α_c constants for sodium chloride are also calculated with this equation, which are comparable with their corresponding values, obtained by Harned and Robinson. α_c and B_c values vary between the limits -0.053 to 0.0548 and -0.087 to -0.0910 respectively, which indicate their independence of total ionic strength. The decrease in solubility of sodium chloride with increase in acid concentration is explained by the change in activity coefficients and by the concept of hydration of the ions.

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THE EFFECT OF CHLOROBENZENE AND CATECHOL ON THE DECARBOXYLATION OF BENZOIC ACIDS

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(Received January 28, 1974; revised September 25, 1974)

Abstract. Kinetic study of the decarboxylation of substituted-benzoic acids have been made in catechol. The reaction is first order, chlorobenzene and dichlorobenzene have a retarding effect on the rate of reaction. No kinetic data has been reported in catechol.

ESTIMATION OF NITRITE IN PRESENCE OF NITRATE

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(Received June 5, 1974)

Abstract. In this investigation sulphamic acid has been used as a titrant for the determination of nitrite in presence of nitrate. The end point is located by the pH measurement. Sulphite, phosphate, chloride and sulphate do not interfere in the procedure. The method is quite precise and accurate and maximum error was 1.3% when a 31.0-mg sample was analyzed.

MICRODETERMINATION OF PHENOL

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Abstract. Phenol has been determined in the range of 58.5–585 μg . *N*-Bromosuccinimide is used as direct titrant and Bordeaux red as an indicator. The maximum relative standard deviation is 1.2 % in the case of 58.5 μg sample. The method is simple and accurate. Resorcinol, α -naphthol and aniline interfere in this procedure.

Short Communications

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FIELD DESORPTION MASS SPECTROSCOPIC STUDY OF STACHYDRINE—A BETAINES FROM CADABA FRUITICOSA

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ISOLATION OF MANNITOL AND β -SITOSTEROL FROM SCHWEIN FURTHIA SPHAEROCARPA A.BR.

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Biological Sciences Section

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MANGANESE REQUIREMENT OF GROWING FAYOUMI CHICKS

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(Received May 29, 1972; revised October 28, 1974)

Abstract. One hundred and eighty one-day old Fayoumi chicks with an average body weight of 30g were divided into 6 groups and were fed the same basal ration but supplemented with MnSO_4 so as to make 6 Mn levels as follows; 15, 30, 45, 60, 75 and 90 p.p.m. Feed intake and weight gain were recorded weekly for each group. Feed and water were offered *ad libitum*.

Body weight increased slightly with Mn in the ration up to 60 p.p.m. Higher Mn levels than 60 p.p.m. was without effect on body weight. Feed efficiency was similar in all groups. Results indicated that the Mn level of 60 p.p.m. reduced the perosis to 3.3%.

Mn in body tissues was significantly affected by dietary Mn. Tibia Mn increased with increasing dietary Mn up to the level of 45 p.p.m. Tissue P and Ca decreased with increasing dietary Mn level.

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MONOGENEA OF PAKISTAN FISHES

Part III. *Dactylogyrus zulfikari*, n.sp., and *D. jaini*, n.sp., from the Gills of *Barbus sarana* (Ham.)

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(Received March 26, 1974; revised October 24, 1974)

Abstract. Two new species of monogenea, *Dactylogyrus zulfikari*, n.sp., and *D. jaini*, n. sp., recorded alongwith *D. barbasi* Rizvi, *Diplozoon indicum* Dayal, and two unidentified species from the gills of *Barbus sarana* (Ham.) of the Indus river have been described.

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MORPHOLOGICAL STUDIES OF SECOND INTERINSTAR OF *SARCOPHAGA HAEMORRHODALIS* (FALLEN) (DIPTERA: SARCOPHAGIDAE) A CAUSATIVE AGENT OF WOUND MYIASIS IN DOG IN KARACHI

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(Received September 12, 1973)

Abstract. During April 1973 a case of wound myiasis caused by *Sarcophaga haemorrhoidalis* (Fallen) in an street dog in Karachi University Campus has been recorded. The important morphological features of only second-interinstar (intermediate stage) of this species has been studied.

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PREPARATION AND CHARACTERIZATION OF DEXTRAN FROM SUCROSE BY THE ACTION OF A LOCALLY ISOLATED STRAIN OF LEUCONOSTOC MESENTEROIDES

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(Received July 3, 1974; revised October 22, 1974)

Abstract. The preparation and characterization of a water-soluble dextran from sucrose by the action of a locally isolated strain of *Leuconostoc mesenteroides* has been studied. The production of dextran in the culture medium reached a maximum of 58% of the available glucose from sucrose in 18 hr. About 68% available fructose was present in the filtrate of the culture medium after removal of the dextran. Extracts of 1 g rice polishing or 0.5 g wheat bran respectively were found to be sufficient for both the growth of the bacteria and production of dextran from 10 g sucrose in 100 ml culture medium.

Technology Section

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BENEFICIATION OF TIRAH GRAPHITE

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(Received October 13, 1973; revised October 14, 1974)

Abstract. Screening and flotation tests on the beneficiation of the Tirah graphite have been conducted for its commercial utilization. The graphite contains 28-30% fixed carbon and can be upgraded by flotation up to 60% with a recovery of 88%. The conditions of the beneficiation of Tirah graphite by screening and flotation techniques have been set. The product obtained can be utilized in foundry, paints and in the manufacture of refractory articles.

INFRARED SPECTROSCOPIC STUDIES ON COALS OF PAKISTAN

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(Received June 5, 1974; revised September 24, 1974)

Abstract. IR studies on four lignites, from two different regions of Pakistan, have been made and compared with the Sharigh lignite having good caking properties. A close correlation of caking properties of the lignite to the appearance of out-of-plane bending vibrations of aromatics in the region $745\text{--}875\text{ cm}^{-1}$ has been used to classify these lignites. Minerals have been detected by the spectrum of ash from the lignite for a preliminary study.

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ON THE IDENTIFICATION OF THE MINERALS OF KAOLINITE SUBGROUP USING X-RAY POWDER METHOD

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Abstract. Because of the close resemblance of the X-ray powder patterns of the minerals of the kaolinite series, particularly kaolinite and dickite, it becomes difficult to differentiate one from the other using the ordinary X-ray powder method of identification. Based on the examination of a composite X-ray powder pattern of kaolinite and dickite, and supported by other evidences based on the analysis of some specific lines, a procedure has been worked out which would help in uniquely identifying the two minerals, even with the usual cameras which have rather poor resolution.

The minerals of the kaolinite subgroup, namely indices. The cell dimensions of the three minerals

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PROPERTIES OF SILICATE GLASSES AS A FUNCTION OF THE RATIO OF p -ELECTRONS TO THE NUMBER OF ATOMS

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(Received March 26, 1974; revised October 5, 1974)

Abstract. It has been shown¹ that if the ratio of the p -electrons in the outermost shell to the number of atoms (A) in an oxide or a system is greater than 2.6, the system can form a glass. Experiments conducted on some of binary, tertiary and quaternary silicate glasses have revealed that viscosity at strain point of the tertiary glasses and refractive index, density and thermal expansion coefficient in temperature range 0–100°C are an inverse function of this ratio nP/A . However, the viscosity values for binary glasses are directly proportional to the ratio nP/A .

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STUDIES IN THE PREPARATION OF OXIDATION—RESISTANT MODIFIED ROSINS

Part III. Preparation and Properties of Stable Fused and Precipitated Zinc Rosinates

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(Received May 20, 1974; revised September 19, 1974)

Abstract. Stable fused zinc derivatives of oxidation-resistant sulphur-modified rosins containing varying amounts of zinc have been prepared without blocking difficulties. Reaction conditions and improvement in properties over unmodified rosins are described in this paper.

EVALUATION OF SWAT CLAY COARSE FRACTION AS A RAW MATERIAL FOR CERAMIC BODIES

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(Received May 28, 1974; revised October 28, 1974)

Abstract. Successful studies were made on the utilization of Swat clay coarse-fraction (-72+200 mesh B.S.S.) as a raw material for ceramic bodies. The ceramic properties of about ten compositions containing predominant amounts of Swat clay were studied. A ceramic body composition with optimum properties has been recommended.