ISSN 0030-9885
Coden: PSIRAA 31(12)815-866(1988)

PAKISTAN JOURNAL OF SCIENTIFIC AND INDUSTRIAL RESEARCH

Vol. 31, No. 12, December 1988

Published monthly by

PAKISTAN COUNCIL OF SCIENTIFIC AND INDUSTRIAL RESEARCH
KARACHI

Physical Sciences Section

Pakistan J. Sci. Ind. Res., Vol. 31, No. 12, December 1988

INFRA RED STUDY ON INTERMOLECULAR ASSOCIATION OF 2-CHLORO, 2,2-DICHLORO AND 2,2,2-TRICHLOROETHANOLS WITH DIFFERENT BASES

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(Received September 14, 1988; revised December 17, 1988)

The proton donor-acceptor complexes formed by mono, di-and trichloroethanols with THF and TEA in CCl_4 solution have been investigated by IR spectroscopy. From the area VS.concentration curves it is concluded that complexation tendency for trichloroethanol is greater than that of its mono and di-derivatives. The frequency shift ($\triangle\nu$) and equilibrium constant (K_{11}) measured for 1:1 complexes between alcohols and bases (THE and TEA) at ambient temperature indicate that the association between alcohols and TEA are about 3-times stronger than those between alcohols and THF.

Key words: Intermolecular association, Mono, di and tri chloroethanole, Different bases.

INTRODUCTION

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DETERMINATION OF NITROGEN (AS AMMONIA) BY INDIRECT TURBIDIMETRIC METHOD

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(Received January 19, 1988; revised December 29, 1988)

A simple indirect turbidimetric method for the determination of nitrogen (as ammonia) is described. The method is based on the formation of yellowish-green fine suspension of zinc-oxinate when ammonia vapours are absorbed by a saturated solution of zinc and oxinate ions. The precipitation is stabilized with *n*-propanol and absorption of the sol is measured.

Key words: Turbidimetry; Nitrogen determination; Ammonia determination.

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INVESTIGATION OF SOME OF THE KINETIC PARAMETERS OF THE HYDROLYSIS OF N-ARYLMALEAMIC ACIDS

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(Received November 19, 1987; revised December 8, 1988)

The hydrolysis of seven substituted N-arylmaleamic acids in acidic medium has been investigated. The reaction follows typical first order kinetics. The rate depends on concentration of substrate and on the basicity of the leaving group. The rate was inversely proportional to the pH of the solution. A free energy relationship has been obtained when log k/k_o was plotted against substituted constants (σ^*).

Key words: Kinetics of substituted maleamic acids, Free energy relationship.

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DETERMINATION OF HEAT CAPACITY OF WATER/ETHYLENE GLYCOL MIXTURES AS A FUNCTION OF MOLE FRACTION OF ETHYLENE GLYCOL BY MEANS OF A DROP HEAT-CAPACITY CALORIMETER

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(Received April 3, 1988; revised December 28, 1988)

The heat capacities of water/ethylene glycol mixtures were determined at 25° using the precise drop calorimeter. It was found that the plot of molar heat capacity of ethylene glycol/water mixtures shows an inflexion at about 0.20 mole fraction of ethylene glycol. This observation is interpreted in terms of structural modification of water in the mixture. It is suggested that this structural modification of water by ethylene glycol might probably contribute to the type of variation of $-\triangle H^{\circ}$ of formation of azide complex of methemoglobin in water/ethylene glycol mixtures below this region.

Key words: Heat-capacity, Water/ethylene glycol, Drop-calorimeter.

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COMPOSITION OF UNDERGROUND WATER FROM SOUTHERN PART OF THARPARKAR DESERT FOR CULTIVATION OF CROPS

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(Received June 1, 1987; revised December 22, 1988)

Underground water samples collected from open wells and hand pumps from Umerkot, Chachro, Mithi, Islamkot and Diplo in the southern parts of the Tharparkar desert were analyzed for pH, total soluble salts (T.S.S), Na, K, Ca, Mg, N,P, CO_3, Cl and SO_4. pH 8.6 and total soluble salts (9543 ppm) at some places were not suitable for plant growth. Nitrogen and phosphorus content were in negligible amounts. Calcium, potassium and magnesium were in the range sufficient for plant growth. Sodium (3600 ppm), chloride (4400 ppm), sulphate (792 ppm) and bicarbonate (832 ppm) were dominant ions and the quality of underground water varied from suitable to unsuitable type for growth of agricultural crops in a hydroponic system.

Key words: Underground water, Ioncomposition, Thar desert.

Short Communication
Pakistan J. Sci. Ind. Res., Vol. 31, No. 12, December 1988

AMINO ACID AND SUGAR CONSTITUENTS OF FLOWERS OF *MANGIFERA INDICA*

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(Received December 28, 1988)

Short Communication
Pakistan J. Sci. Ind. Res., Vol. 31, No. 12, December 1988

A STUDY OF SILAJIT FROM PAKISTAN

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(Received December 21, 1988)

Biological Sciences Section

Pakistan J. Sci. Ind. Res., Vol. 31, No. 12, December 1988

STUDIES ON THE PRESERVATION OF HERBAL MEDICINES BY TREATMENT WITH HYDROGEN PHOSPHIDE

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(Received October 13, 1987; revised December 10, 1988)

Preservation of dried herbal medicines was studied by treatment of the material with hydrogen phosphide. Samples of *Ziziphus vulgaris* (Unnab), *Viola odorata* (Banafshah) and *Cordia latifolia* (Sapistan) were treated in a fumigation chamber under an atmosphere of 5×10^{-3} g/l of hydrogen phosphide for 24 hours. The treatment effectively killed all the insects and diminished the microbial counts. The general appearance of the samples (i.e. colour and lustre) was also maintained. Treated samples remained insect-free for a considerable time (more than four months) when stored under proper conditions and away from infested samples.

Studies were also carried out to evaluate the possible toxic effects of hydrogen phosphide by fumigating rat diet under identical conditions and feeding the animals with this diet. Pseudo-choline esterase, glutamate pyruvatetransaminase, alkaline phosphatase and bilirubin were determined in the serum. No significant difference was found in the values of these parameters when the control and experimental groups were compared.

These results indicate the suitability of hydrogen phosphide for the preservation of dried herbs from insect-invasion and safety of the material for subsequent use, when applied with proper precautions.

Key words: Medicinal herbs, Preservation, Hydrogen phosphide.

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FACTORS INFLUENCING GERMINATION AND DORMANCY OF *HONCKENYA PEPLOIDES* (L). EHRH

Part I. Improvement of Germination

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(Received September 26, 1988; revised December 2, 1988)

Dormancy in *Honckenya peploides* L Ehrh. is environmentally induced presumably as an ecological adaptation to protect seed from premature germination in the adverse environmental conditions. Dormant seeds failed to germinate without treatment and germination was accomplished by subjecting seeds to alternating periods of high and low temperatures. Chemical treatments with gibberellic acid (GA_3), kinetin or a combination of both enhanced germination.

Key words: Dormancy, Germination, *Honckenya peploides.*

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A PRELIMINARY STUDY ON THE VEGETATION OF RAWAL EXPERIMENTAL SUB-CATCHMENT AREA

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(Received August 13, 1986; revised December 5, 1988)

A vegetation and soli survey was conducted in Rawal experimental watershed area during September-October, 1984. Vegetation was studied for: i) dissected rolling plains ii) stream beds iii) northern aspect iv) southern aspect and v) western aspect. Plant communities predominant were: *Cynodon dactylon Dichanthium annulation, Cynodon dactylon, Cyperus rotundus, Themeda anathera, Dodonia viscosa, Carissa opaca, Themeda anathera, Carissa opaca, Dodonaea viscosa, Dodonaea, Carissa opaca, Themeda anathera, Dodanaea Themeda anathera* and *Dodonaea viscosa.* The amount of total nitrogen and organic matter ranges from 0.07 to 0.11% and 0.93 to 2.05% respectively. The quantity of total available potassium from 31.2 to 70.2 ppm and phosphorus from 1.4 to 6.7 ppm. The prevailing vegetation of the sub-catchment was of low quality as the representative species have least economic importance. Therefore these species should be replaced by some fast growing species of forage value.

Key words: Vegetation, Soil, Community, Aspect, *Dodonia.*

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ASSIMILATION OF LOW MOLECULAR WEIGHT ALCOHOLS FOR THE PRODUCTION OF LIPIDS BY SOME SOIL FUNGI

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(Received September 14, 1988)

Aspergillus terreus Thom and *Fusarium solani* (Mart) Sacc. have the ability to utilize ethanol, methanol and i. propanol as sole sources of carbon for lipid biosynthesis. 100g of dry mycelia of *A. terreus* grown on ethanol and methanol-containing media was confirmed to contain 22.22 g and 21.43 g lipids, respectively, compared with 25.29 g on glucose-medium. *F. solani* on the other hand could assimilate ethanol more easily than glucose. The organism had got the power to accumulate 20.71% and 18.49% on ethanol and glucose-media successively. Maximal formation of the non-polar lipids was obtained when methanol was the only carbon source. On the other hand, glucose was the best carbon source for polar lipid accumulation. Components of both polar and non-polar lipids on glucose-medium did not differ from those synthesized on both ethanol and methanol-media, although they differ quantitatively. Unsaturated fatty acids were the prevailing acids in lipids of the two organisms, however lipids of *A. terreus* are characterized by more unsaturation.

Key words: Assimilation, Alcohol, Lipid.

Short Communication
Pakistan J. Sci. Ind. Res., Vol. 31, No. 12, December 1988

THE POOR ADHESIVENESS TO THE HOST PLANT CHARACTERIZING THE CHINESE LAC INSECT

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(Received December 21, 1988)

Technology Section

Pakistan J. Sci. Ind. Res., Vol. 31, No. 12, December 1988

A MODIFIED SOXHLET EXTRACTOR FOR USE IN TOXICOLOGICAL ANALYSIS

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((Received January 6, 1988; revised May 22, 1988))

A soxhlet extractor which can be used at room temperature and under reduced pressure has been described. It is useful in toxicological analysis and for the extraction of plant materials.

Key words: Soxhlet, Continuos,, Reduced pressure.

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DIGESTIBILITY OF STRAWS AFTER PHYSICAL TREATMENTS

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(Received May 30, 1988; December 3, 1988)

In vivo digestibility of wheat and rice straw was improved after steam/pressure treatment. Reduction in cellulose and lignin was also observed after this treatment. Digestibility of straws was improved when the particle size was reduced from 80-100 mesh. However, the digestibility was reduced when particle size was further reduced.

Key words: Straw, Physical treatments, Digestibility.

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A NEW METHOD FOR THE DETERMINATION OF CYANOGENETIC GLYCOSIDES

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(Received June 1, 1988)

The prussion blue test for hydrogen cyanide has been combined with the use of Tiron (disodium salt of catechol-3.5 disulphonic acid) to determine quantitatively the hydrogen cyanide from cyanogenetic glycosides. The method is sensitive and colorimetric.

Key words: Tiron, Cyanogenetic glycosides, Colorimetric.