

ABSTRACTS

DEPARTMENT OF PHYSICS

8. INVESTIGATION OF THE DEGREE OF PERFECTION OF A CRYSTAL BY MEANS OF POLARIZED X-RAYS. S. Ramaseshan and G. N. Ramachandran, *Proc. Ind. Acad. Sci.*, 1954, 39, 20.

SUMMARY

The paper describes an investigation of the intensity of Bragg reflection when the incident X-rays are polarized and the azimuth of the electric vector is varied with respect to the plane of reflection. It is observed, using natural and ground (211) faces of NaNO_3 , that the variation of intensity with azimuth of polarization is different for a mosaic and a perfect crystal. Such a difference is in fact to be expected from theoretical considerations. The actual behaviour of both the ground and the natural faces was found to be intermediate between what is predicted by theory for an ideally perfect and an ideally mosaic crystal. By comparing the observed azimuthal variation of the integrated reflection with the theoretical expectation for the two limiting cases, it is possible to assess the degree of perfection of the crystal.

9. THE RELATION BETWEEN MAGNETO-OPTIC ROTATION AND OPTICAL DISPERSION IN SOME HALOGEN ACIDS AND THEIR SALTS. V. Sivaramakrishnan, *Proc. Ind. Acad. Sci.*, 1954, 39, 31.

SUMMARY

The Verdet constant and optical dispersion of the halogen acids and some of the univalent halide salt solutions have been measured at various concentrations. From these the value of molecular magnetic rotativity, molecular dispersivity, and molecular refractivity and hence the magneto-optic anomaly factor of the ions have been estimated. The values of these constants for the ions at infinite dilution are got by extrapolation. It is found that the value of the anomaly factor of the free ions having inert gas configuration is slightly lower than the theoretical value of unity. The anomaly factor in the case of HCl, HBr and HI does not vary with concentration and the low value of .80 and .85 in the case of HCl and HBr compared to their alkali salts is attributed to the formation of H_3O^+ ion in aqueous solutions. The systematic decrease in rotativity, dispersivity and the anomaly factor in the case of salts of univalent halides is explained to be due to the hydration and clustering of the ions. It is found that the value of γ of the ions in solution is higher than that for the ions in the crystalline state.

DEPARTMENT OF BIOCHEMISTRY

Food Technology

1. SUPPLEMENTARY VALUE OF PROCESSED SOYA FLOUR. H. Srikantiah and R. Rajagopalan, *Science and Culture*, 1953, 19, 212.

A simple method of obtaining full-fat flour from soya bean has been developed. Bread made with this flour and wheat flour was employed for studying the nutritive value, using albino rats as the experimental animals. Results show that incorporation of 15% soya flour to wheat flour enhances the nutritive value of such a bread nearly twice as compared to that with bread made of wheat flour only.

2. SOYABEAN MILK—FEEDING EXPERIMENTS WITH ARMY BOYS. Major G. L. C. Philips, T. A. Venkitasubramanian, R. Rajagopalan and S. S. De, *A.M.C. Journal*, 1952, 8, 199.

Monthly records of weight, height, hæmoglobin, R.B.C. plasma protein were maintained over a period of 6 months for the control (receiving 1 lb. 9 oz. of cow's milk) and the experimental (receiving 1 lb. 9 oz. of soya milk) groups of army recruits. There were 200 subjects in each group. The statistical analysis of the data did not show significant differences between the two milks, indicating thereby that soya milk is nearly as good as cow's milk.

Sanitation Biochemistry

1. AMINO ACIDS IN SEWAGE AND ACTIVATED SLUDGE. S. C. Pillai, G. J. Mohan Rao, K. Krishnamurthy and A. V. S. Prabhakara Rao, *Curr. Sci.*, 1953, 22, 235.

Raw sewage, activated sludge and purified effluent were analysed for their amino acid contents by the recently developed method of circular paper chromatography. Raw sewage was found to contain almost all the essential amino acids. During purification of sewage by the activated sludge process the amino acids were concentrated in the sludge, and the purified effluent was practically free from amino acids.

2. PROTOZOAL DEVELOPMENT AND NATURAL PURIFICATION OF FLOWING SEWAGE. S. C. Pillai, G. J. Mohan Rao, A. V. S. Prabhakara Rao, C. V. Natarajan and I. B. Madappa, *Indian Medical Gazette*, 1953, 88, 507-08.

The sewage from the City of Bangalore (10-14 million gallons a day) allowed to flow down in the suburbs of the City over a gradient land along open channels was found clarified and purified as it travelled down

distance of 5-6 miles. Continued observations over a period of 21 months showed that certain protozoa (species of *Epistylis* and *Carchesium*) occurred in abundance at the point of purification, and experiments showed that these protozoa played a vital role in the purification process. Such purification of sewage and such abundant occurrence of colonial vorticellids under natural conditions are reported to have not been recorded before.

Chromatography

1. SEPARATION AND IDENTIFICATION OF THE DEGRADATION PRODUCTS OF PURINES AND NUCLEIC ACIDS ON ACID HYDROLYSIS BY CIRCULAR PAPER CHROMATOGRAPHY. K. V. Giri, P. R. Krishnaswamy, G. D. Kalyankar and P. L. Narasimha Rao, *Experientia*, 1953, 9 (8): 296.

The circular paper chromatographic technique was used for the study of the degradation products of purines and nucleic acids, particularly adenine and compounds containing the adenine nucleus. It was found that adenine and its compounds gave rise to 4 (5) amino-5 (4) imidazole carboxamide with an absorption maximum $\lambda_{max} = 287 \mu$. besides glycine on acid hydrolysis.

2. SEPARATION OF SIMPLE SACCHARIDES AND OLIGO-SACCHARIDES BY CIRCULAR PAPER CHROMATOGRAPHY. K. V. Giri and V. N. Nigam. *Naturwissenschaften*, 1953, 40, 343-44.

The mono-, di- and oligo-saccharides were separated by the circular paper chromatographic technique using *n*-butanol-acetone-water (20:70:10) as the developing solvent and aniline-diphenylamine phosphate as the chromogenic reagent.

3. APPLICATION OF CIRCULAR PAPER CHROMATOGRAPHY TO THE STUDY OF THE MECHANISM OF AMYLOLYSIS. K. V. Giri, V. N. Nigam and K. Saroja, *Naturwissenschaften*, 1953, 40, 484.

Using the circular paper chromatographic technique the products of the enzymic hydrolysis of amylose and starch were studied. It was shown that while the action of β -amylase on amylose and starch resulted in maltose only, α -amylase and taka-diaxase acted on amylose and starch giving rise to maltose and other higher saccharides.

4. SIMPLE PAPER CHROMATOGRAPHIC METHOD FOR THE ESTIMATION OF VITAMINS B₁ AND B₂. K. V. Giri, *Curr. Sci.*, 1953, 22, 373.

A paper chromatographic method for the separation and estimation of vitamins B₁ and B₂ has been described. Vitamin B₁ was initially

transformed into [thiochrome by reaction with cyanogen bromide and ammonia. The colour of the thiochrome and riboflavin bands were extracted with water and acidulated water respectively and the fluorescence of the solutions were measured in a Klett-Fluorimeter.

5. FILTER PAPER DISC CHROMATOGRAPHY. K. V. Giri, *Nature*, 1953, 171, 1159.

The author contradicts the statement of Proom and Woiwod that filter-paper disc chromatography is not a substitute for large scale paper chromatography in the separation of more complex mixtures such as protein hydrolysates. He reiterates the view that using the techniques developed in their laboratories, a complete analysis of protein hydrolysates can be made by filter-paper disc chromatography.

6. CHROMATOGRAPHY. K. V. Giri and A. L. N. Prasad, *Ann. Review of Biochemical and Allied Research in India for 1952, 1953*, 23, 1.

The authors have reviewed the published work done in India on Chromatography during the years 1950-52.

Miscellaneous

1. PHOTOLYSIS OF AMINO ACIDS IN SUNLIGHT IN PRESENCE OF THE PHOTOSENSITIZER, TITANIUM DIOXIDE. K. V. Giri, G. D. Kalyankar and C. S. Vaidyanathan, *Naturwissenschaften*, 1953, 40, 440.

It has been shown by the use of circular paper chromatographic technique that many amino acids decompose giving rise to other amino acids when their aqueous solutions are exposed to sunlight in presence of titanium dioxide. A scheme for the reactions undergone by glutamic acid under the influence of light is presented.

2. ENZYMIC SYNTHESIS OF OLIGOSACCHARIDES BY *Penicillium chrysogenum* Q-176. K. V. Giri, P. L. Narasimha Rao, K. Saroja and R. Venkataraman, *Naturwissenschaften*, 1953, 40, 484.

It has been shown that *Penicillium chrysogenum*, Q-176 is capable of synthesising oligosaccharides from maltose and sucrose. The culture solutions as well as the mycelial extracts of the strain grown on a medium containing maltose as the carbohydrate source, contained enzymes which converted maltose into iso maltose, two disaccharides and one higher saccharide.

3. NITROGEN METABOLISM OF *Penicillium chrysogenum*, Q-176. P. L. Narasimha Rao and R. Venkataraman, *Experientia*, 1952, 8, 350.
4. SOILS AND FERTILISERS. S. C. Pillai and S. V. Govindarajan, *Ann. Review of Biochem. and Allied Research in India for 1952, 1953*, 23, 113.

An account of the work done in India during 1952 on the various aspects of soils and fertilisers is given.

5. FOOD TECHNOLOGY. S. Balakrishnan and R. Rajagopalan. *Ann. Review of Biochem. and Allied Research in India for 1952, 1953*, 23.

An account of the work done in the field of Food Technology in India during 1952 is presented.

Pharmacology Laboratory

1. STUDIES IN THE CHEMOTHERAPY OF MALARIA. A. C. Roy, S. S. Guha, N. K. Keshavamurthy, G. R. Chandrashekar, K. P. Menon and P. C. Guha, *J. Sci. and Ind. Res.*, 1953, 12, 474.

Ninety compounds including 28 in guanidine series, 39 in biguanide, 19 in triguanide and 3 each of bisguanide and bisguanidine series were prepared and screened for their activity against *p-gallinaceum* infection in chicks. None of the compounds was found to be superior to paludrine although a few compounds exhibited significant and comparative antimalarial activity.

2. EXPERIMENTAL STUDIES ON THE USE OF SANDAL WOOD AND NEEM OILS AS CONTRACEPTIVES. M. Sirsi, *J. Mys. Med. Assn.*, 1953, 18 (3), 17.

The pad and oil method mentioned as a simple and effective contraceptive technique by the Family Planning Association of India, Bombay, advocates the use of sandal wood oil and neem oil. Experiments undertaken to assess the value of this method indicate that both the oils have no effective spermicidal activity *in vitro*. No evidence of interference in conception was exhibited by these oils when fertility tests were conducted on rats.

3. STUDIES ON THE ARTERIO VENOUS ANASTOMOSIS IN THE LUNGS USING RADIOACTIVE PHOSPHORUS. M. Sirsi and K. Bucher, *Experientia*, 1953, 9, 217.

Experiments were undertaken to get quantitative data regarding the functioning of these arterio-venous anastomosis in various species of animals.

Radioactive spheres (p^{32}), with diameters of 25 to 30 μ were injected into the jugular veins of narcotised animals and radioactivity retained in the lungs determined. Rats, guineapigs, rabbits and cats were the experimental animals.

Analysis of the results indicate the existence of A-V anastomosis in all the species examined as well as variations in the extent of anastomoses in the different species. It was also observed that within a small range of variation the extent of anastomoses is comparatively constant for each species.