
SCIENCE NOTES AND NEWS

School in Theoretical Chemistry

A School in Theoretical Chemistry will be held between the 2-14 of April 1962 at the Department of Physical Chemistry, The Hebrew University, Jerusalem, Israel—under the direction of Professor C. A. Coulson, F.R.S., Oxford University and Dr. L. E. Orgel, Cambridge University and with the participation of Professor R. Pauncz and Dr. J. Jortner. A knowledge of theoretical chemistry at an intermediate level is required of those wishing to participate. Those interested are requested to write immediately to the Department of Physical Chemistry.

Conference on Hydraulics and Fluid Mechanics

The University of Western Australia, Faculty of Engineering, is to hold a Conference on Hydraulics and Fluid Mechanics in Perth, December 6th-13th, 1962 (incl.).

Contributions are invited from the fields of aeronautical, civil and mechanical engineering, applied mathematics, chemistry, physics, agriculture, biology, medicine, zoology and others in which fluid flow presents problems of measurement, instrumentation, basic understanding or analysis.

For copies of the First Circular giving full information please write to the Conference convener, School of Engineering, University of Western Australia, Nedlands, Western Australia.

Symposium on Plant and Animal Viruses

A two-day symposium on recent advances in Plant and Animal Viruses was held at Cuttack on December 31, 1961 and January 1, 1962. The symposium was inaugurated by Dr. P. Parija, Vice-Chancellor of the Utkal University. Prof. T. S. Sadasivan, Director of the University Botany Laboratory, Madras, was the Convener. A number of scientists actively engaged in this field of research from the various universities and research institutes in the country took part in the symposium.

Lady Tata Memorial Trust Scholarships for 1962-63

The Trustees of the Lady Tata Memorial Trust invite applications from Medical or Science graduates of Indian nationality for six scholarships of Rs. 250 each per month for the year 1962-63 tenable in India for whole-time

research work on a subject bearing on the alleviation of human suffering from disease. Applications, which should reach by March 15, 1962, must conform to prescribed instructions which can be obtained from the Secretary, Lady Tata Memorial Trust, Bombay House, Bruce Street, Fort, Bombay-1.

"Impact"

The latest issue of *Impact*, Vol. XI (1961), No. 3, the quarterly published by the UNESCO, Place De Fontenoy, Paris 7^e (France), contains the following articles: Mankind and Outer Space; The Decisive Step in the Conquest of Cosmic Space by E. K. Fedorov; General Problems Confronting Computing Centres by R. Courant; Fish Technology and the Community by G. H. O. Burgess; and Science and the Road Traffic Problem by G. Charlesworth.

The first article describes the orbital flight of the first Soviet astronaut Gagarin on April 12, 1961, and of Shepard the first American astronaut on May 5, 1961.

The last article describes the results of research in Great Britain on such traffic problems as the movement of traffic, its economics, roads lay-out, traffic control, road accidents, etc.

The Root of *Oxalis latifolia* HBK.

Messrs J. P. Sinha and U. N. Jha, Department of Botany, Ranchi University, Ranchi, write: The species of *Oxalis latifolia* HBK. grows luxuriantly in Ranchi usually in damp habitats after summer when monsoon breaks. The characteristic feature of the species growing at this place is the presence of either one main or rarely two or three distinct succulent roots which are found in the form of conical or fusiform as has been reported for the species of *Oxalis tetraphylla*.

Rearing of More than One Generation of Univoltine Silkworms

With reference to the article on "Rearing of more than one Generation of Univoltine Eggs" by A. S. Atwal and A. N. Verma, published in *Current Science*, 1961, 30, 435, Sri. N. K. Gururajan, Principal, All-India Sericultural Training Institute, Mysore-4, writes: The procedure of artificially breaking the diapause in the eggs of silkworms (*Bombyx mori*) of uni and bivolt-

tine origin by treating them in hydrochloric acid of 1.075 sp. gr. at 46° C. for 5 minutes has been in vogue both in foreign countries and also in India for more than two decades and it is a matter of routine to get many brooded varieties from uni and bivoltines, both in the univoltine regions of Kashmir, Punjab and Uttar Pradesh and in multivoltine areas of Mysore and Madras. This information has been published already in several reports. Some of the Government Farms in Kashmir and Uttar Pradesh have been adopting this method of breaking the dormancy in univoltine and bivoltine races for commercial rearing. It may be noted for information, to break the diapause in silkworm eggs even cold hydrochloric acid of 1.1 sp. gr. is used extensively at room temperature with good rearing results.

Field Ionization Technique in Mass Spectrometry

At the Fourth International Symposium on Mass Spectrometry held at Rhodes House, Oxford University, on September 11-15, 1961 a new instrumental technique was outlined by Becky. In this, the conventional ion source was replaced by a field ionization source in which the molecules are subjected to an intense field of the order of 10^8 V/cm. The effect of this is to modify the potential wall of the molecule in such a way that an electron can escape in the ground state. As a result the molecule does not acquire any excitation and does not undergo fragmentation. The mass spectra resulting from field ionization are thus very simple and the molecule ion predominates. This 'weak' method of ionization makes it possible to study molecules which would otherwise decompose in a conventional source and permits the examination of molecular associations. Polymeric ions of water, ethanol and propanol have been examined in this way.

Radioactivity in Rainfall during September 1961 following the Russian Nuclear Tests

Results of experiments on radioactivity of rain-water reported from the Research Laboratory of the Associated Electrical Industries, Berks, show the activity to be distinctly higher after September 2, 1961 that is, following the commencement of the Russian nuclear tests, than in previous months.

Analyses were made for the total β -activity per litre of the rain-water sample collected, as well as per gm. of the residue of the sample after evaporation. Maximum activity was

shown by the sample collected on September 13-14. This was 8050 $\mu\mu\text{C./gm.}$ for the residue, and 48.4 $\mu\mu\text{C./l.}$ for the rain-water. Compared to this the corresponding figures for previous months were 160 $\mu\mu\text{C./gm.}$ and 5.1 $\mu\mu\text{C./l.}$

That the excess activity was due to fission products was confirmed by specific isotopic analysis for iodine-131. This activity in rain-water was found to be 9.8 $\mu\mu\text{C./l.}$ for sample collected on September 13-14, 95.5 $\mu\mu\text{C./l.}$ for those collected on September 14-18, and 14.2 $\mu\mu\text{C./l.}$ for sample of September 27.—(*Nature*, 1961, 192, 443.)

Automation Applied to X-Ray Crystallography

Research into the atomic structure of crystals will be significantly accelerated by a new X-ray diffraction technique which is almost entirely automatic. The new technique called Pexrad (Programmed Electronic X-ray Automatic Diffractometer) has been developed by Bell Telephone Laboratories, and is similar in principle to their automatic neutron diffractometers which are currently being used in many nuclear reactor laboratories.

In the Pexrad method information such as crystal lattice constants, the wavelength of the X-ray beam, and instrumental constants are fed to the computer on punched cards, along with a compiling programme. The computer generates a magnetic tape from which a punched paper tape is made. Fed into Pexrad, it controls the motors which rotate the crystal and receiving counter into position, and then causes an X-ray beam of prescribed wavelength to irradiate the crystal for a precise length of time. The intensity of the beam which is diffracted by the crystal is measured and recorded on punched tape. The crystal is automatically rotated to the next position and the process is repeated.

The punched tape from Pexrad containing the readings is converted to a magnetic tape and is fed back into the digital computer. The computer integrates the intensities, corrects for absorption, rotation, Lorentz and polarization factors, and prints out the corrected data from which the location of the individual atoms can be calculated.

With Pexrad, a crystal can be oriented with a hundredth-of-a-degree accuracy; therefore, it can be used to study almost any non-biological crystal. The method could be extended to protein crystals, which need about one-thousandth-of-a-degree accuracy in crystal positioning—(*Jour. Frank. Inst.*, 1961, 272, 343)

High-Temperature Heat Capacity of Diamond

Recent measurements at the National Bureau of Standards have resulted in improved values for the high-temperature heat capacity of diamond. These data, obtained over the range of 323 to 1,073° K. and accurate to within 0.5% over most of the range, join smoothly with other values down to the temperature of liquid hydrogen. An experimental basis is thus provided for the verification of theoretical treatments of diamond lattice dynamics over a wide range of temperatures. Precautions were taken to prevent oxidation of the diamonds in the present work, and the data obtained are believed to be more reliable than previous results (1926) in the temperature range employed.

Diamond-type crystals are of considerable interest for several reasons. Because the "low temperature" behaviour of the diamond extends to nearly 1,000° K., useful data can be obtained with both low- and high-temperature calorimeters. Also, as the interatomic forces in the diamond lattice are largely covalent, continued investigation should provide further information concerning the directional characteristics of these bonds. Furthermore, silicon and germanium, materials of increasing scientific and industrial importance, possess crystal structures similar to the diamond.

The usual procedure for solving problems concerning diamond lattice dynamics is to propose a model of the interatomic forces and, employing the elastic constants and first-order Raman frequency shift, to solve a series of equations leading to a calculated value of heat capacity. In order to check the results of such a treatment, reliable values of measured heat capacity must be available—(National Bureau of Standards News.)

Seminar on Aeronautical Sciences

The above Seminar was organized by the National Aeronautical Laboratory, Bangalore, under the auspices of the Council of Scientific and Industrial Research and was held from 27th November to 2nd December 1961. The Seminar was inaugurated by the Governor of Mysore and presided over by Prof. M. S. Thacker, Director-General of the Council of Scientific and Industrial Research.

Over 250 delegates including 20 delegates from such foreign countries as Australia, France, Holland, Japan, United Kingdom and U.S.A., attended the Seminar. The delegates were wel-

comed by Dr. P. Nilakantan, Director of the National Aeronautical Laboratory. The technical sessions of the Seminar covered several fields of aeronautical interest.

The session on Aviation Meteorology was presided over by Dr. P. R. Krishna Rao, Director-General of Observatories, India. The main topic discussed was wind structure at high altitudes and its influence on air navigation. The session on Aircraft Structures and Materials was presided over by Dr. V. M. Ghatage, Deputy General Manager, Hindustan Aircraft Ltd., Bangalore. Among the topics discussed were creep, fatigue and thermal effects. Prof. S. Dhawan, Indian Institute of Science, Bangalore and Prof. R. Kawamura, Aeronautical Research Institute, University of Tokyo, Japan, presided over the two sessions on Aerodynamics and papers on formation and stability of shock waves, hypersonic aerodynamics and approximation in transonic flow were presented. The highlights of the session were major surveys on aerodynamic noise by Prof. M. J. Lighthill, Director, Royal Aircraft Establishment, U.K. and Mr. Arthur A. Regier, National Aeronautics and Space Administration, U.S.A. In the two sessions on Fluid Mechanics presided over respectively by Prof. Lighthill and Prof. P. L. Bhatnagar, Indian Institute of Science, Bangalore, papers on flow in bent pipes, transition and nature of turbulence, boundary layer problems in hypersonic flows and models for plasma oscillations were discussed. Dr. Frank L. Wattendorf, Director, Advisory Group for Aeronautical Research and Development (NATO), France, presided over the session on Wind Tunnel Design and Testing, Aircraft Propulsion and Flight Research. Papers were presented on wind tunnel design problems, particularly at high subsonic and transonic speeds. Particular interest was shown in a report by Mr. F. W. Hooton of the Aeronautical Research Laboratories, Australia, on the formation of a flight research group in his Laboratories. Prof. S. V. C. Aiyar, Indian Institute of Science, Bangalore, presided over the session on Aviation Electronics and among the papers presented the one by Mr. W. A. Johnson on Recent Researches done at Royal Aircraft Establishment in the field of aviation electronics and that by Mr. L. R. Lucassen, National Aeronautical Research Institute, Holland, on an instantaneous method for measuring antennae radiation pattern of the Fokker-27 in flight, evoked considerable interest.

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