Isotopes and Molecular Asymmetry

QUITE recently¹, attempts have been made to resolve into their optically active components, molecules of the type $C.H.D.R_1.R_2$, with very slight success, if any at all. In 1922², I suggested that if this type of asymmetry associated with isotopes was responsible for very slight rotation or none at all, a molecule of the type $C.x.y.R_1.R_2$, should be investigated, x and y being atoms or groups of similar electronic configuration. In view of the resemblance (which some physicists consider is a real one) between the electronic configuration of the methyl radical and

the fluorine atom, the molecule of α -fluor-propionic acid might be a fit subject for investigation. This substance may have no optical activity, if the recent results are correct. I am not aware that asymmetric molecules containing CH_3 and F as dissimilar groups have ever been subjected to optical resolution.

T. IREDALE.

University,
Sydney.
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¹ Erlenmeyer and Gartner, *Helv. Chim. Acta*, **19**, 145, 331 (1936);
Coppock and Partridge, *NATURE*, **137**, 907 (1936).
² *NATURE*, **109**, 779 (1922).

Points from Foregoing Letters

GRAPHS showing the hourly variations in the (square of the) critical penetration frequency (f^2) of radio waves for the C_1 ionizing region of the atmosphere, located at a height of 55 km., are given by Dr. H. Rakshit and J. N. Bhar. Prof. Mitra, commenting on one of their remarks, points out that the critical penetrating frequency cannot be taken as a measure of the density of ionization since it depends upon both ionization density and upon collisional frequency, which vary independently.

An experiment conducted by Chas. R. Burrows on the propagation of ultra-short radio waves over freshwater shows that a revision of the Sommerfeld-Rolf curves is required in those cases where the dielectric constant is taken into account.

Max G. E. Cosyns has measured specific ionization of cosmic rays in hydrogen, helium and argon by comparing the efficiency of Geiger-Müller counters for different internal pressures. The results are given for argon, helium and hydrogen. The absolute intensity of cosmic radiation at Brussels has been found to be 0.0266 per second per sq. cm.

Forty litres of methane with a single substituted deuterium atom have been made by Drs. W. H. J. Childs and H. A. Jahn, in order to obtain its absorption spectrum in the photographic infra-red. Preliminary results are given and the spectrum compared with that of ordinary methane.

From data obtained by Kox on the amplitude of light variation of three separate wave-lengths in different regions of a pulsating star (δ Cephei), and assuming that Planck's formula for 'black body' radiation holds in such cases, A. E. H. Bleksley concludes that the light variations in cepheid variables is consistent with the view that the radius of their photosphere (layer from which comes most of the light that reaches us directly, that is, without absorption and re-emission) is considerably greater at minimum than at maximum luminosity.

In discussing the osmotic function of the contractile vacuoles of Protozoa, Dr. J. A. Kitching points out that while one might expect the rate of vacuolar output to decrease after the external osmotic pressure has been raised above the original internal osmotic pressure of the organism, one would not necessarily expect the contractile vacuole to stop completely. Changes of body volume, and hence of internal osmotic pressure, must also be taken into account.

According to Dr. P. Meyer, the colloid osmotic pressures of the body fluids of freshwater animals are in the order of phylogenetic development, but 20-35 per cent lower than those exerted by the body fluids of the corresponding marine animals. Regarding the freshwater fauna as a regressive branch of the aquatic fauna in general, this is not necessarily contrary to the hypothesis of a relation between the general organization of an animal and the colloid osmotic pressure of its body fluids.

Dr. H. A. Krebs describes chemical changes which pyruvic acid undergoes in living cells. These reactions are intermediate steps in the biological breakdown of carbohydrates; they shed light on the relations between the metabolism of carbohydrates and of ketone bodies, and on the physiological function of vitamin B_1 .

D. J. Bell states that glycogen obtained from the whole tissue of the edible mussel, and also from the liver of fasted rabbits (after oral administration of galactose) consists of 18 glucose units, while the glycogen obtained from the liver of rabbits under normal conditions, or that from fish liver, consists of 12 glucose units. No significant difference in the properties of the two glycogens has been observed.

The action of the phosphatase enzyme of the kidney (which splits phosphoric acid esters) is found by Dr. H. Kalekar to be much more strongly inhibited by phloretin than by its glucoside, phloridzin, a bitter principle in the bark of apple and other trees.

It has been found that the vibrational frequency of a molecule AB is the mean of the frequencies of the molecules A_2 and B_2 when A and B belong to the same Periodic Group and where the frequencies of A and B are not too dissimilar. Dr. H. G. Howell points out that this result follows if the force constant is considered to be the same for molecules within a given group.

Prof. K. Herrmann prefers to ascribe certain discrepancies in the X-ray scattering factors of zinc and of cadmium to the asymmetry of the atoms rather than to lattice vibrations, and gives reasons for his preference. Dr. G. W. Brindley, in reply, maintains his opinion that the lattice vibrations are responsible for the asymmetry and considers that, while the outermost electrons of the zinc and cadmium atoms may depart from spherical symmetry, the inner complete electron shells are not likely to do so.