quence of the decrease in the solubility of cadmium chloride with decrease of temperature. The development of turbidity by these crystals on annealing lends support to such a precipitation.

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[1] For a detailed review of the work, see Lidiard, A. B., *Handbuch der Physik*, **20**, 246 (Berlin, 1957).

Ultrasonic Velocity in Aqueous Solutions of Some Electrolytes

While carrying out investigations in a number of aqueous solutions of electrolytes, we have observed the interesting feature of a decrease of ultrasonic velocity with increase of concentration in the case of aqueous solutions of calcium iodide, zinc bromide, silver nitrate and cerous acetate, contrary to the normal type of behaviour exhibited in general by electrolytes. Velocity measurements in the above solutions of electrolytes at 30° C. were carried out using a fixed-path, variable frequency interferometer[1], at a frequency of 1·5 Mc./sec. The accuracy of the measurements is ± 1 m./sec. The variation of density with concentration in all the above cases is found to be linear.

The variation of ultrasonic velocity with concentration is shown in Fig. 1. In all the electrolytes investigated, zinc bromide, calcium iodide and silver nitrate exhibit a decrease in velocity of 88, 43 and 40 m./sec., respectively, for a concentration of 3 moles/litre. In spite of the peculiar behaviour in the variation of velocity with concentration, it is found that the adiabatic compressibility shows a regular decrease with increase of concentration in all these electrolytes. All other properties, like molar sound velocity and apparent molal compressibility, also showed a regular linear variation with concentration except in the case of cerous acetate, for which the variation of apparent molal compressibility with concentration is irregular.

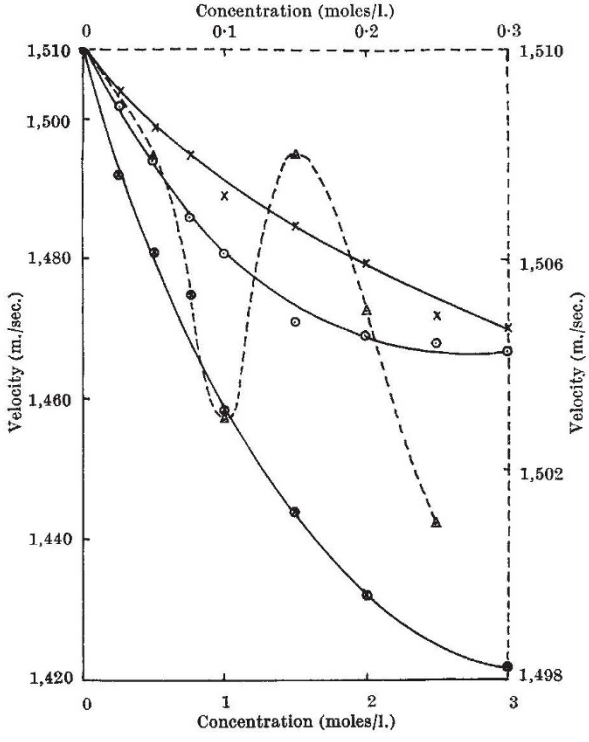

Fig. 1. Variation of ultrasonic velocity with concentration in aqueous solutions of electrolytes. ⊙, Calcium iodide; ×, silver nitrate; ⊗, zinc bromide; △, cerous acetate

It has been reported by earlier investigators[2–4] that electrolytes with heavy radicals or those having complex ions exhibit a decrease in velocity with increase in concentration. The decrease of ultrasonic velocity in the case of zinc bromide can be explained as due to the formation of complex ions, and that in calcium iodide as due to the heavy acid radical. But in the case of silver nitrate which does not form any complexes in aqueous solutions this result is unusual as similar salts like barium nitrate[5], with heavier metallic radicals, show an increase of velocity with concentration. In the case of cerous acetate the irregular variation of velocity with concentration is interesting.

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RADIATION CHEMISTRY

Photochemical Production of Semiconducting High Polymers

Polymers may be rendered semiconducting by heating to form graphitic structures[1]. Such non-specific treatment results in a drastic deterioration of physical properties of the polymer and a change in form of the samples. We have found that ultra-violet light irradiation of chlorinated high polymers transforms them into semiconductors. This treatment has advantages over the pyrolysis method in that: (*a*) by selective choice of ultra-violet wave-lengths specific chemical reactions are produced; (*b*) the reactions may be confined to specified areas. In fact, we have found that at the border of irradiated regions unique *p*–*n* junctions are produced.

In our experiments we irradiated films about 12μ thick of a commercially available saran which is a copolymer of vinylidene chloride (85 per cent) and vinyl chloride (15 per cent). All additives present were removed by soaking in acetone and then in ethanol so that no carbonyl groups are observed in the infra-red spectrum. For exclusively far ultra-violet irradiation we employed a 15-W. mercury resonance lamp (General Electrical Germicidal) which produces mainly 254 mμ. For near ultra-violet irradiation we used a 100-W. intermediate pressure lamp (Hanovia *SH*) in conjunction with a Corning 9–53 glass filter which removes all wave-lengths below 300 mμ, and for mixed irradiation this lamp was used without a filter.

Irradiation with far ultra-violet produces materials the spectra of which are given in Fig. 1. After subtracting out the background (curve *A*) the curves exhibit a broad maximum at about 285 mμ. The shape of the curve and the position of the maximum are maintained