same result within the margin of error. In each liquid only one kind of negative ion was observed. The divergence among measurements resulting from changes in ambient temperature and from change of liquid sample remained, in most cases, within permissible limits.

The results of the measurements of the mobility of the ions as a function of the electric field strength are depicted graphically in Fig. 2. The range of the measurements was limited by the available high-voltage supply (10 kV.) and the rise-time of the light pulses (about 5×10^{-5} sec.). The results obtained indicate a lack of dependence on the field in the range studied. The possible experimental error introduced due to uncertainty in the electrode spacing was constant throughout each series of measurements, and considering only the dispersion of measured values the field independence is more clearly shown. Pyong-un Chong et al.[1], who measured the mobility in pure hexane and with the addition of 1 per cent ethyl alcohol for fields between 50 and 150 kV./cm., did not observe any dependence on the field either.

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Mobility of Ions in Liquid Dielectrics

THE first extensive investigations concerning the mechanism of the movement of ions in liquid dielectrics were undertaken by Adamczewski[1,2]. He investigated systematically a group of liquid-saturated hydrocarbons ranging from pentane to nonane, and formulated the empirical dependence between the viscosity of the liquid (η) and the mobility of ions (u), $u = A\eta^{-3/2}$. This dependence has been established by measurements at constant temperature.

In connexion with the investigations carried out by Gzowski and Terlecki[3], as well as LeBlanc[4], in which the existence of rapid negative ions has been determined, it was of interest to verify the above-mentioned formula for these ions, and to investigate its applicability at different liquid temperatures.

In this work measurements of the mobility of negative and positive ions produced by means of X-rays in n-hexane, n-heptane, n-octane, n-decane and mixtures of n-octane–n-hexane and n-decane–n-hexane in the range of temperatures from 8° to 50° C. have been made, using the 'layer method'[3]. All the liquids investigated had a residual conductivity $k \leqslant 10^{-19}$ Ω^{-1} cm.$^{-1}$. The viscosity was measured using Hoeppler and Arrhenius viscosimeters.

Characteristic differences between negative and positive ions were observed. The mobility of negative ions in all these liquids was found to be greater than that of the positive ions. The transit time of the
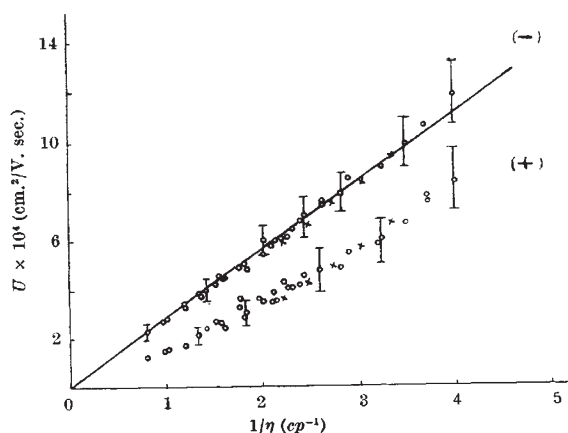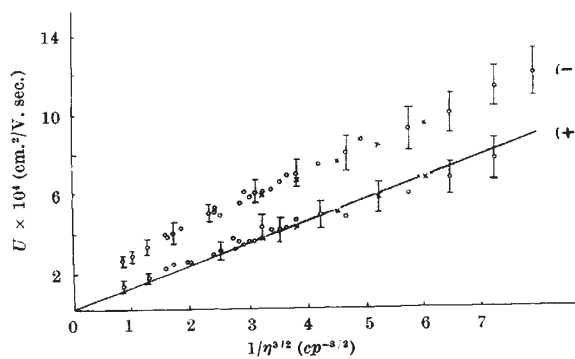

Fig. 1

Fig. 2

front edge of the negative ion layer was sharply defined, which indicated the existence of ions with small diffusion velocity. The diffuse velocity spectrum for positive ions showed that several kinds of ions were present. Because of the low resolving power of the apparatus, the mobility of only the most rapid positive ions has been determined.

Fig. 1 shows that the negative ion mobility may be expressed by the equation $u = B\eta^{-1}$, in agreement with Stokes's law, while Fig. 2 verifies that within the limits of the experimental error the positive ion mobility satisfies the equation $u = A\eta^{-3/2}$, where $A = 1.2 \times 10^{-7}$ cm.^{2}/V. sec. poise$^{2/3}$. The crosses on both diagrams show results obtained for n-heptane. Detailed results and discussion will be published.

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Birefringence induced by Acoustic Waves in Polystyrene Solutions

WHEN an ultrasonic wave passes through certain liquids and solutions they exhibit double refraction and behave as uniaxial crystals with their optic axes lying along the direction of propagation of the