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Diffraction of X-Rays in Liquids: Effect of Temperature

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duced by the juxtaposition of the two OH groups. None of the others showed this type of orientation. This evidence was obtained by a second semi-orderly arrangement of molecules with diffraction centers in planes separated by a distance of the magnitude of two molecular lengths.

Ten compounds gave also an additional set of planes, caused more importantly by the positions than by the nature of the substituents. Of these ten, three, the hydroxy dimethyl benzenes, showed the three sets of planes; namely, one corresponding to the thickness of the ring, one to an arrangement in a perpendicular direction caused by the substituents, and one in a third direction perpendicular to the other two sets and corresponding to the double molecules of the polar groups.

The above conclusions are in harmony with current investigations from other view points and strengthen the theory of semi-orderly and temporary space arrangements of the molecules in a liquid, or the cybotactic condition.

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DIFFRACTION OF X-RAYS IN LIQUIDS: EFFECT OF TEMPERATURE

E. W. SKINNER

Using an x-ray spectrometer similar to that used by G. W. Stewart, experiments are being carried out on the effect of varying temperature on liquid scattering, temperatures varying from room temperature to near the boiling points being used. To date, two liquids, cyclohexane (27°C and 83.5°C) and heptyl (heptylic) acid (28°C and 193°C) have been examined. Results and conclusions are as follows:

(1) The planar spacing giving the distance between molecules increases with increase in temperature (0.28 Å.u. for heptylic acid and 0.16 Å.u. for cyclohexane) change for temperatures noted. This change is attributed to the volume expansion of the liquid. In the case of heptylic acid, the dimension denoting the length of the molecule was not changed, which shows that expansion taken place in one direction only relative to the lengths of the molecules.

(2) The width of the peak increases at the higher temperatures. This is due to the disrupting of the molecular groupings due to thermal agitation, thus producing a more diffuse scattering.

(3) With increase in temperature a decrease in intensity (about 20%) of the peak denoting molecular widths was observed. This is probably due to two causes: (a) expansion of the liquid, (b) disarrangement of the scattering centers, thus diminishing the effective scattering interference.

These results and conclusions are found to be in harmony with the theory of the cybotactic condition.

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A MOLECULAR VELOCITY FILTER

JOHN A. ELDRIDGE

A method has previously been described by which the velocity of molecules could be measured. A qualitative combination of Maxwell's distribution law was obtained. A filter is being constructed which will have much greater resolving power and also greater sensitivity.

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AN INVESTIGATION OF THE CRITICAL POTENTIALS OF THE SPARK SPECTRUM OF CADMIUM

DEVER COLSON

The direct spectroscopic method was used in which the spectrum was excited by electron impact. The accelerating voltage on the electrons was varied 8.8 (ionization potential of Cd) up to 200 volts. Measurements on the films were made with a microphotometer. The effects of change of plate current and vapor pressure were investigated.

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INTENSITY OF MERCURY LINES EXCITED BY POSITIVE IONS

C. FRISCHE

Observations were made concerning the intensity of lines of the

