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X-Ray Diffraction by Organic Solutions

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and each of the other carbons is connected through a ballast resistance to the other side.

With carbons of proper diameter it is found that the double arc thus formed burns steadily and without flicker and the carbons burn down equally.

IOWA STATE COLLEGE,
AMES, IOWA.

A SIMPLE REFRIGERATION SYSTEM FOR THE FARM

L. V. CRUM

The object has been to find a cheap and efficient method of storing and insulating ice which might be used for cooling purposes on the farm.

A large tank was filled with a solid cake of ice by adding a small amount of water each evening during cold weather. The cooling chamber consists of a small compartment directly beneath the metal base of the tank, and is well insulated from outside effects.

IOWA STATE COLLEGE,
AMES, IOWA.

X-RAY DIFFRACTION BY ORGANIC SOLUTIONS

ALFRED W. MEYER

Series of ionization diffraction curves of two organic solutions with varying concentrations were obtained using Mo K α radiation. The solutions used were normal butyl alcohol with orthodimethyl-cyclohexane and normal ethyl alcohol with cyclohexane. The diffraction peaks were found to shift from the peak of one member to that of the other as the solution was changed from 100% of one member to 100% of the other. Also the width of the peak was found to vary in the same manner with the exception that the width was a maximum at a low percentage of the liquid, the peak of which was of least width. There was no evidence of a double peak indicating that the liquids did not diffract individually. A curve was obtained by using the components separately but measuring the diffraction of both liquids simultaneously and this curve clearly showed the peaks of both liquids. This proved that the spectrometer could resolve the peaks of both liquids if they had been present in the diffraction by the solutions.

Stewart, Morrow, and Skinner have shown that the diffraction peaks of organic liquids indicate a grouping of the molecules and that the Bragg Law approximates the spacings. The solution diffraction curves then indicate that the molecules of both constituents form a single type of group and that the spacing is determined by the proportion of the constituents present. The width of the curve may indicate that the grouping is less perfect than in the pure liquids. These conclusions are very similar to those found in the case of the diffraction by solid solution.

THE EFFECT OF PRESSURES UP TO 16,000 ATMOSPHERES UPON THE E. M. F. OF THE WESTON STANDARD CELL

THOMAS C. POULTER, CARTER RICHEY, ROBERT WILSON,
JOHN FULTON

A variety of types of Weston standard cells were constructed and the electromotive force was found to increase with the pressure. The shape of the curve being effected somewhat by the material of which the cell case was constructed.

IOWA WESLEYAN COLLEGE,
MT. PLEASANT, IOWA.

RESISTANCE CHANGE IN A MAGNETIC FIELD OF SINGLE CRYSTALS OF BISMUTH

ROY A. NELSON AND G. R. WATSON

The work is a continuation of that of Schneider.¹ Crystals were made from several different samples of bismuth and by two methods. The fractional change in a longitudinal field of about 3,000 gauss is found to be a minimum for 0 orientation and a maximum for 90. The crystals, however, fall into two classes, the reason for which has not been determined. The supposition of any considerable fissures along the cleavage planes appears unlikely.

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¹ Phys. Rev., vol. 31, p. 251, 1928.