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## The Solvating Power of Anhydrous Magnesium Bromide as a Possible Function of Its Preparation Temperature

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of composition  $(\text{CH}_3\text{CONH}_2)_2 \cdot \text{H}_2\text{O}$ . The system is especially characterized by two solubility curves of acetamide in water, one lying ten to twelve degrees below the other. This is due to the two modifications of pure acetamide, with melting points at  $80^\circ\text{C}$ . and  $69.4^\circ\text{C}$ . In the more dilute solutions, supercooling can be carried to  $80^\circ$  below the crystalizing temperature in sealed tubes.

The Binary System acetamide-naphthalene, investigated by the freezing point method shows two eutectics, one compound formation and a pair of immiscible liquids with a critical solution temperature.

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## THE SOLVATING POWER OF ANHYDROUS MAGNESIUM BROMIDE AS A POSSIBLE FUNCTION OF ITS PREPARATION TEMPERATURE

H. H. ROWLEY AND JACK A. CAMPBELL

Before undertaking a study of the solvates of magnesium bromide, a method for preparing a reproducibly active anhydrous salt must be found. A suitable method is by the direct union of magnesium and bromine in ether, according to the procedure of Zelinsky. This results in the formation of etherates, from which the anhydrous salt can be obtained by desolvating at a moderately high temperature in a vacuum. It is known that if too high a temperature is used in the preparation of anhydrous aluminum oxide or calcium sulfate, the resulting product will not recombine with water. It is conceivable that the solvating power of anhydrous magnesium bromide, prepared from its etherates, might in an analogous way be a function of the preparation temperature.

To test the possible effect of temperature on the solvating property of magnesium bromide, samples were desolvated under reduced pressure at  $100^\circ$ ,  $200^\circ$ ,  $300^\circ$  and  $400^\circ\text{C}$ . A constant stream of air saturated with ether at  $20^\circ$  was then passed over the samples, which were kept at  $25^\circ$  and weighed at intervals. The rates of solvation for the various samples were found to be equal within experimental error. It is conceded that the necessity of using interchangeable ground-glass joints permitted the entrance of traces

of moisture, but within the temperature ranges studied, we feel justified in stating that the solvating power of anhydrous magnesium bromide is not a function of its preparation temperature.

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### THE CONSTRUCTION AND USE OF A CONCAVE GRATING SPECTROGRAPH

W. C. OELKE AND GEORGE MONTROSS

In order to learn some of the fundamentals of analytical spectrography, a concave grating spectrograph was constructed as a cooperative student-faculty project. Details of construction and methods of use were given. Both qualitative and quantitative applications of the instrument are considered.

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### A QUANTITATIVE SPECTROGRAPHIC STUDY ON THE EFFECTS OF THE ALKALI METALS UPON THE DETERMINATION OF CALCIUM

LOUIS WALDBAUER AND JOHN A. MEANS

It has been known for some time that in spectrographic analysis each element present has some effect upon the other elements present. Our investigation of the effect of the alkali metals on calcium showed that, in general, the intensity of the spectral lines of calcium increased with an increase in the percentage of the alkali metal present. However, there is a decrease in the intensifying effect at the higher concentrations. The chlorides of the alkali metals used were in concentrations varying from 1.0 per cent to 0.031 per cent, and the concentrations of the calcium solutions used varied approximately over the same range. Slides were