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## Binary System with Acetamide: (1) Acetamide - Water (2) Acetamide - Naphthalene

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perature and others a lower transition temperature than that of corresponding hydrates, suggests tentative conclusions as to the relative degree of hydration on the cations and anions.

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### ETHYL ETHERATES OF ZINC BROMIDE

H. H. ROWLEY AND FLORENCE V. OLSON

The solvation of solid zinc bromide in contact with diethyl ether solutions has been studied by vapor pressure measurements and solubility determinations from  $-10$  to  $35^{\circ}\text{C}$ . The existence of two solvates, believed to be the dietherate of zinc bromide,  $\text{ZnBr}_2 \cdot 2(\text{C}_2\text{H}_5)_2\text{O}$  and the monoetherate of zinc bromide,  $\text{ZnBr}_2 \cdot (\text{C}_2\text{H}_5)_2\text{O}$ , was indicated by the following results: Definite changes in slope occurred in the curves obtained by plotting the logarithm of the vapor pressure of ether for systems of varying mol ratios (mols  $(\text{C}_2\text{H}_5)_2\text{O}$ /mols  $\text{ZnBr}_2$ ) against the reciprocal of the absolute temperature and by plotting the logarithm of the solubility of zinc bromide in ether against the reciprocal of the absolute temperature. These changes in slope, which are caused by changes in the solid phases, appear between  $0$  and  $5^{\circ}$  and between  $15$  and  $25^{\circ}\text{C}$ . Further, analyses of the wet solids in contact with the saturated solutions at  $0$ ,  $15$  and  $25^{\circ}\text{C}$ . indicate that the stable solid phases in equilibrium with the saturated solutions at these temperatures are the dietherate, the monoetherate and the unsolvated zinc bromide, respectively.

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### BINARY SYSTEMS WITH ACETAMIDE (1) ACETAMIDE — WATER (2) ACETAMIDE — NAPHTHALENE

BEN H. PETERSON

The binary system acetamide and water, investigated by the solubility method, shows the formation of a hydrate of acetamide

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