THE DISTRIBUTION OF COLLOIDAL ARSENIOUS SULPHIDE BETWEEN THE TWO LIQUID PHASES IN THE SYSTEM WATER, ETHER, ALCOHOL

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The present paper gives the results of some quantitative measurements of the distribution of colloidal arsenic trisulphide between the two liquid phases formed when ether, water and alcohol are mixed in proper proportions; that equilibrium involving the distribution of colloids may be realized experimentally was established in 1908 by Lash Miller and McPherson,[1] who made also a preliminary study of the conditions affecting the distribution ratio.

The binodal curve and the tie lines at 0° C for the system Ether—water—alcohol were determined by Bonner,[2] who employed a method designed rather to permit measurement with very small quantities than to furnish extremely accurate results. As a preliminary, therefore, it was necessary to redetermine the curve and lines; accurate specific gravity measurements also were made of solutions of known composition on the binodal curve, and a graph was constructed so that the composition of any one of a pair of solutions in equilibrium could be found simply by determining its density.

Satisfactory methods of preparing the colloidal solutions and of determining their content of arsenic were then worked out, and a method of allowing for the effect of the colloid on the specific gravity of the solutions was checked experimentally. Finally, some twenty measurements of the distribution ratio were made and their results collated.

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[1] Jour. Phys. Chem., 12, 709 (1908); see also Reinders: Zeit. Kolloid-Chemie, 13, 235 (1913).

[2] Jour. Phys. Chem., 14, 738 (1910); a very complete study of the system alcohol–water–ether at 25° C has been made by Shinkichi Horiba, see Memoirs of the College of Science and Engineering, Kyoto Imperial University, Vol. 3, No. 3, p. 63 (1911).