Thermal Diffusion in Liquids

Howard Carr

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Letters to the Editor

PROMPT publication of brief reports of important discoveries in physics may be secured by addressing them to this department. The closing date for this department is the third of the month. Because of the late closing date for the section no proof can be shown to authors. The Board of Editors does not hold itself responsible for the opinions expressed by the correspondents. Communications should not in general exceed 600 words in length.

Depolarization of Raman Lines

A Further Simplification of Method

GEO. GLOCKLER, JOHN F. HASKIN, AND CLAIRE C. PATTERSON
Department of Chemistry, University of Iowa, Iowa City, Iowa
June 9, 1944

GLOCKLER and Baker[1] have studied the use of Polaroid in the measurement of the depolarization factors of Raman lines. They used a mica plate in order to rotate one of the components following the method of Stitt and Yost.[2] Lately we have realized that the mica half-wave plate is unnecessary if the two Polaroid films are positioned in front of the spectrograph so that their line of contact is at 45° to the vertical axis of the spectrograph. Preliminary results seem to show that this method will work satisfactorily. This suggested arrangement is published now because further work will be delayed for an unknown period on account of the war.

[1] Geo. Glockler and H. T. Baker, J. Chem. Phys. **11**, 446 (1943).
[2] F. Stitt and D. M. Yost, J. Chem. Phys. **5**, 90 (1937).

Thermal Diffusion in Liquids

HOWARD CARR
Physics Department, University of South Carolina, Columbia, South Carolina
July 12, 1944

A THERMAL diffusion tube similar to that described by Korsching and Wirtz[1] has been used to observe effects obtainable by varying some of the parameters involved in thermal diffusion experiments.

The tube, formed by clamping a rectangular Pliofilm gasket between two brass strips, has been previously described.[2] Since difficulty was encountered in keeping the tube liquid tight with a 100-gauge Pliofilm gasket, 450-gauge Pliofilm[3] was substituted. The diffusion column thus formed was rectangular in cross section, 1.59×0.057 cm, and 1 meter long. The average temperature difference ΔT maintained between the top and bottom sides of the tube was 49°C.

TABLE I.

Molar concentration of $ZnSO_4$	Time in hours	Tube slope in degrees	C_B/C_T
0.6	2	45	3.70
0.6	4	45	4.97
0.6	8	45	10.8
0.6	12	45	17.1
0.4	2	45	3.04
0.6	2	45	3.70
0.8	2	45	2.85
0.6	2	6	2.55
0.6	2	15	2.87
0.6	2	30	3.28
0.6	2	45	3.70
0.6	2	60	3.62
0.6	2	75	3.09
0.6	2	85	2.71

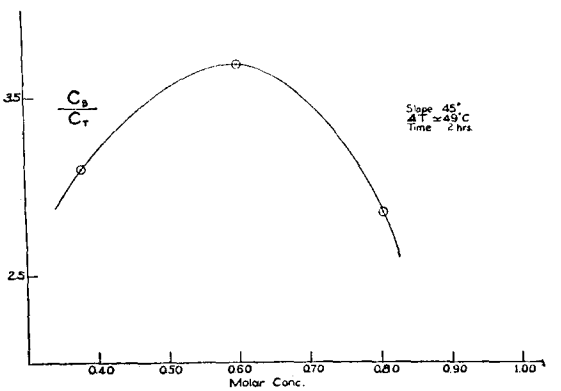

FIG. 1.

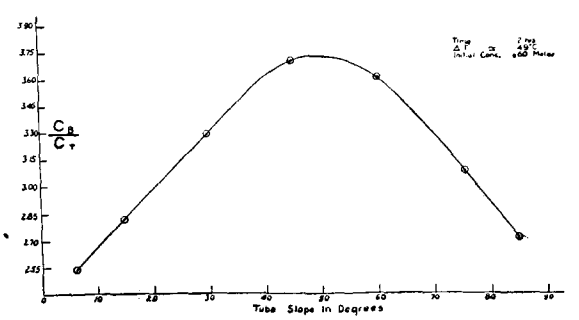

FIG. 2.

Solutions of $ZnSO_4$ were used throughout the investigation since they had been previously shown to give a large effect.[1] Analyses of concentration were made by measurement of the refractive index.

The results are given in Table I. The effected separation is expressed as the ratio of the molar concentration C_B of a sample taken from the bottom of the tube to the concentration C_T of a sample from the top.

Figures 1 and 2 are graphs of data taken from Table I. They show more clearly the maxima obtained.

[1] Korsching and Wirtz, Naturwiss. **27**, 367 (1939).
[2] H. Carr, Phys. Rev. **61**, 726A (1942).
[3] Kindly supplied by the Goodyear Rubber Company, Akron, Ohio.