

FIG. 7. Relative viscosity at 30° of eugenol carbon disulphide against concentration.

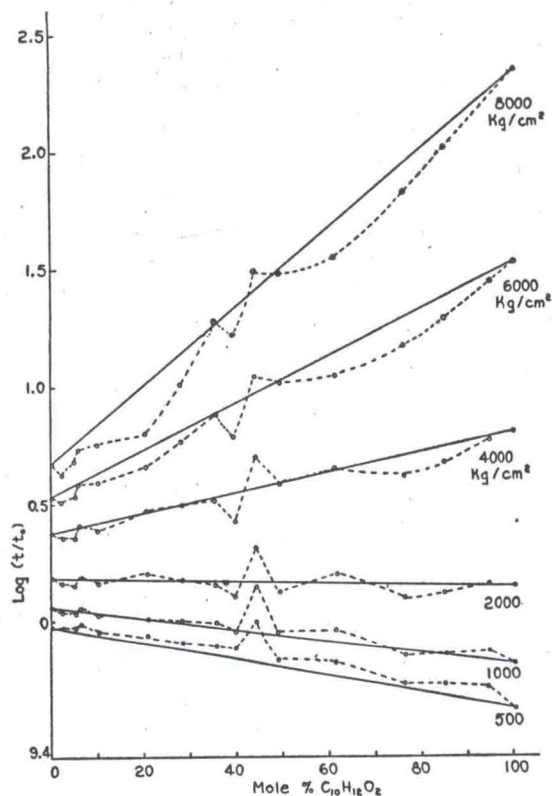


FIG. 8. Relative viscosity at 75° of eugenol carbon disulphide against concentration.

ether, *n*-hexane chlorobenzene, *n*-pentane benzene, and eugenol carbon disulphide display various kinds of irregularities which are in no way similar for these mixtures. For example, the

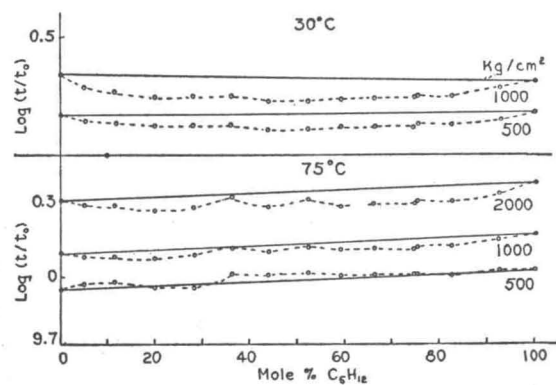


FIG. 9. Relative viscosity at 30° and 75° of *n*-pentane benzene against concentration.

peaks in the hexane chlorobenzene isobars do not appear on the corresponding pentane benzene curves; also, the same curves for hexane ether exhibit distinctive complexities. Inasmuch as these mixtures of the second group, with the exception of pentane benzene, contain a polar component, it is possible that complexes or associations of molecules will affect the results. Although the effects of association, as judged by the departures of the density-concentration curves from linearity do not seem to be significant for the viscosity of the mixtures at atmospheric pressure, the effects at high pressures may play important parts in the observed viscosity. While the final free space arrangement of the molecules depends little on whether the molecules are in a combined or free state, it is clear that the effect on viscosity will be different, for the mechanism of viscous resistance involves relative motion of interlocked structures which in turn will depend on the molecules of the mixtures.

Bridgman¹⁷ in discussing association as applied to his results on water at high pressures prefers to leave open the question of whether pressure increases or decreases the amount of association, although his results suggested that pressure merely influenced the effects of association without necessarily changing the amount. Collins,¹⁸ from an investigation of the infrared absorption spectra of liquids known to associate, concludes that his results indicated no change in association

¹⁷ P. W. Bridgman, Proc. Am. Acad. 47, 546 (1912).

¹⁸ J. R. Collins, Phys. Rev. 39, 305 (1930).

with change of degree of association. The effect of pressure, by increasing the amount of interlocking

From these results it is concluded that the interlocking is complicated by the presence of the component. The observed irregularities in Figs. 3 to 9 are due to the interlocking of the component with the other component. It is not possible to attempt to explain these irregularities by stated that the interlocking of the component is impossible to explain mentally.

The results are significant and are classified with the results of the other mixtures, however, from the irregularities in the curves at 30° are not uniformly of the same nature, which vary in amount at different pressures, at the different temperatures, and at the different pressures. The nature of the irregularities in the curves at 30° are not the same as those at 75°.

A complete investigation of the viscosity isobars would show that the irregularities in the curves are about the same as those in the curves at 30°. There is a tendency for the irregularities in the curves to be in the same direction of