

which might be improved by introducing the densities calculated from the approximately known compositions of the two layers and the densities of alcohol water and chloroform, neglecting contraction on mixing.

The position of the "plait-point," *i. e.*, the composition of the system in which the two layers of liquid are almost identical in composition, was found graphically, and checked by direct experiment: it is chloroform 3.5 cc, water 6.5 cc, alcohol 9.8 cc.

Arsenic trisulphide, water, chloroform, alcohol, near the plait-point

Solutions were then made up containing 5.5 cc chloroform, 4.5 cc "water" (*i. e.*, 4.5 cc altogether of the solutions of arsenious acid and hydrogen sulphide in various proportions) and alcohol in quantity almost sufficient to make a homogeneous solution. The actual amount of alcohol needed depends on the temperature and also no doubt on the excess of arsenious acid or of hydrogen sulphide present, but it was not far from 9.6 cc. In no case was distribution observed; the sulphide always remained altogether in the upper layer, although in one experiment the compositions of the two phases were so nearly identical that partial separation was effected only by five minutes whirling in a good centrifuge (10 inch arm, 2000 rev. per minute) while complete separation needed a quarter of an hour. In this experiment the total volume was 15 cc, and the volumes of the two phases after separation were almost exactly equal; addition of less than $\frac{1}{60}$ 0.02 cc of alcohol made the whole homogeneous.

To ascertain whether the arsenious sulphide remained in the upper layer because of some "passive resistance," pairs of solutions—upper and lower—were made up from the data of Fig. 1, using pure water in the preparation of the "upper" and the solutions of arsenious acid and hydrogen sulphide in the preparation of the "lower" layers. On mixing, while the volumes of the two layers remained unaltered, the arsenious sulphide passed completely from the