

Density of Liquids and Refractive Index of Liquids in Contact. By A. L. CLARK, Ph.D., Prof. of Physics, Queen's University, Kingston, Ontario.

WHILE experimenting with various pairs of liquids which remain sufficiently insoluble to maintain a meniscus of separation, I came across the phenomenon described below. Chloroform, which is nearly insoluble in water and possesses a density of about 1.4 at ordinary temperature, has a critical density of about .5. The density of water at 260°, the critical temperature of chloroform, is about .66, so that as the temperature rises, the density of chloroform falls off more rapidly than that of water, and at one temperature they are equal. I placed chloroform and water together in a Natterer's tube and heated in a paraffin bath. At a few degrees below the critical temperature of chloroform the equilibrium becomes unstable and the system overturns, the chloroform rising to the top. As it cools down again the chloroform sinks again to the bottom*.

The temperature at which the phenomenon occurs is higher than was expected from the study of liquid density curves of other liquids (that for chloroform seems never to have been investigated). This is due no doubt to the solution of chloroform in the water and water in the chloroform tending to equalize the densities. With pure chloroform and water, however, the upset is certain. The phenomenon is very interesting to watch, particularly when the system is cooled. The chloroform settles down into the water stretching the surface film more and more, and finally breaks through.

Another very interesting phenomenon discovered in the

* The same phenomena may be seen with aniline and water.