

SOME LECTURE EXPERIMENTS ON SURFACE TENSION¹

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Surface tension affords abundant scope for attractive lecture experiments. The experiments outlined in this paper have been used for many years by the writer, and although less spectacular than many described in the literature, have been found very effective in making clear the principles of surface tension in its application to the chemical phenomena of solubility and adsorption.

1. *Mechanical Model.*—This serves to illustrate the definition of surface tension in work units as the maximum quantity of work that can be gained when a surface is decreased in area by one square centimeter. A projection cell 40 mm \times 10 mm and 60 mm high, the upper edges of which have been coated with a film of paraffin wax, is filled almost to overflowing with water. On the surface is floated a thin shaving of cork 30 mm \times 5 mm \times 1 mm, to which is attached a fine cotton thread about 40 mm long terminating in a little glass hook. The thread passes over a small pulley made from a pill box and a pin resting in a double Y-shaped glass bearing. Three weights of glass or bent wire, weighing about 0.1 gram, 0.07 gram and 0.04 gram may be hung on the hook. The middle weight approximately balances the surface tension, while the lighter one on being pulled down with a pair of tweezers is lifted again by the surface tension. A fall of 1 cc produces one square centimeter of surface: viz., 0.5 cm² on the forward under side of the cork which is wet with water and 0.5 cm² on the upper surface of the liquid in the cell. The whole of an apparatus of the size described may be pro-

¹ Expts. Nos. 1, 2, 4, 6 and 7 were shown at a local meeting of the American Chem. Soc. at Niagara Falls, January, 1909. 3(a) and 5 at a lecture at the Research Laboratory, General Electric Co., January, 1911, and 3(b) in a lecture by Mr. Howe and the writer at the Washington meeting of the American Chem. Soc., December, 1911.