



P 1.8.4

Surface tension

P 1.8.4.1 Measuring the surface tension using the tear-away method

Measuring the surface tension using the tear-away method (P 1.8.4.1)

Cat. No.	Description	P 1.8.4.1
367 46	Apparatus for measuring surface tension	1
664 175	Crystallization dish, 95 mm dia., height = 55 mm	1
314 111	Precision dynamometer, 0.1 N	1
311 52	Vernier callipers, plastic	1
300 76	Laboratory stand II	1
300 02	Stand base, V-shape, 20 cm	1
300 43	Stand rod, 75 cm	1
301 08	Clamp with hook	1
671 9740	Ethanol, fully denaturated, 250 ml	1
675 3400	Water, pure, 1 l	1

To determine the surface tension σ of a liquid, a metal ring is suspended horizontally from a precision dynamometer. The metal ring is completely immersed in the liquid, so that the entire surface is wetted. The ring is then slowly pulled out of the liquid, drawing a thin sheet of liquid behind it. The liquid sheet tears when the tensile force exceeds a limit value

$$F = \sigma \cdot 4\pi \cdot R$$

R : edge radius

This experiment determines the surface tension of water and ethanol. It is shown that water has a particularly high surface tension in comparison to other liquids (literature value for water: 0.073 Nm^{-1} , for ethanol: 0.022 Nm^{-1}).