

P 2.1.2

Thermal expansion of liquids

P 2.1.2.1 Determining the volumetric expansion coefficient of liquids



Determining the volumetric expansion coefficient of liquids (P 2.1.2.1 b)

In general, liquids expands more than solids when heated. The relationship between the Volume V and the temperature ϑ of a liquid is approximately linear here:

$$V = V_0 \cdot (1 + \gamma \cdot \vartheta)$$

V_0 : volume at 0°C, ϑ : temperature in °C

When determining the volumetric expansion coefficient γ , it must be remembered that the vessel in which the liquid is heated also expands.

In this experiment, the volumetric expansion coefficients of water and methanol are determined using a volume dilatometer made of glass. An attached riser tube with a known cross-section is used to measure the change in volume. i. e. the change in volume is determined from the rise height of the liquid.

Cat. No.	Description	P 2.1.2.1 (a)	P 2.1.2.1 (b)	P 2.1.2.1 (c)
382 15	Dilatometer, 50 ml	1	1	1
382 34	Thermometer, -10° to + 110 °C	1		
666 193	Temperature sensor NiCr-Ni		1	
666 190	Digital thermometer with 1 input		1	
315 05	School and laboratory balance 311, 311 g	1	1	1
666 767	Hot plate, 150 mm dia., 1500 W	1	1	1
664 104	Beaker, 400 ml, ss., hard glass	1	1	1
300 02	Stand base, V-shape, 20 cm	1	1	1
300 42	Stand rod, 47 cm	1	1	1
301 01	Leybold multiclamp	2	2	2
666 555	Universal clamp, 0...80 mm dia.	2	2	2
671 9720	Ethanol, fully denaturated, 1 l	1	1	1
524 009	Mobile-CASSY			1
524 0673	NiCr-Ni Adapter S			1
529 676	NiCr-Ni temperatruue sensor 1.5 mm			1