

Common properties of bodies

Volume

Determining the volume of irregular solid bodies - Overflow method

Object of the experiment

1. Determining the volume of irregular solid bodies by means of the overflow method

Setup



Stand setup:

- Slide the 400 mm long stand tube over the other one by about 10 cm, and connect the tubes using the universal bosshead.
- Clamp the stand tube with the smaller diameter in the stand base.
- Fasten the clamp with hook to the other stand tube.

The height of the stand setup can now be adjusted continuously by carefully loosening the lower screw of the universal bosshead.

Apparatus

1 Weight, 0.1 kg	683 10
1 Weight, 0.2 kg	683 11
1 Weight, 0.5 kg	315 38
1 Overflow vessel.....	362 04
1 Measuring cylinder, 100 ml, set of 2.....	590 08ET2
1 Stand base, V-shape, 20 cm	300 02
1 Stand tube, 450 mm, 10 mm diam., set of 2.....	666 609ET2
1 Stand tube, 400 mm, 13 mm diam.	666 607
1 Universal bosshead.....	666 615
1 Clamp with hook	301 08
1 Measuring beaker, PP, 1000 ml	604 211
1 Colouring, red , 10 g.....	309 42
1 Fishing line, set of 2	309 48ET2

Carrying out the experiment

- Suspend a weight from the hook with a piece of fishing line of about 20 cm length.
- Add colouring to approx. 500 ml of water in the measuring beaker.
- Place the measuring cylinder below the outlet of the overflow vessel.
- Fill the overflow vessel with coloured water until the water just runs out of the outlet into the measuring cylinder.
- Empty the measuring cylinder and put it back below the overflow vessel.
- Loosen the lower screw of the universal bosshead and slide the weight with the stand tube downwards until the weight has entirely dipped into the water.
- Wait until the water displaced by the weight has completely run into the measuring cylinder.
- Read the volume of the water from the measuring cylinder.
- From this determine the volume of the body.
- Repeat the measurement with other weights.

Measuring example

Body	V_{water} in ml	V_{body} in cm^3
weight 0.5 kg	78	78
weight 0.2 kg	32	32
weight 0.1 kg	19	19

Evaluation

The volume of an irregular solid body can be determined with the aid of a full overflow vessel and a measuring cylinder.

The volume of water that has been displaced and has run into the measuring cylinder corresponds to the volume of the body entirely immersed into the water.