Object of the experiment

1. Demonstrating the effect of buoyancy

Setup

Apparatus

1 Buoyancy apparatus	361 61
1 Beaker, TPX, 3000 ml	664 134
1 Colouring, red, 10 g	309 42

Carrying out the experiment

- Pull the thread so that the disc is firmly pressed to the glass cylinder of the buoyancy apparatus.
- Hold the glass cylinder with the disc vertically and immerse them in the beaker, which is filled with coloured water. Let go of the thread when the disc is some centimetres below the water surface.
- Slowly move the cylinder downwards and upwards.
- Observe the disc.

Observation

After you have let go of the thread, the disc keeps adhering to the cylinder.

Even if the cylinder is carefully moved downwards and upwards in the beaker, the disc is not taken off.

Only when the disc is about 1 cm below the water surface, does it come off and fall down.

Evaluation

The pressure due to gravity acting on a body at a certain depth of immersion is the same on all sides of the body. This pressure increases with increasing depth of immersion.

The gravity pressure acting on the bottom of a body in water is called buoyancy.

If the glass cylinder with the disc is immersed in the beaker, buoyancy acts on the disc from below.

That means, a force F acts on the disc in the opposite direction of its gravitational force G.

At greater depths of immersion, the force F resulting from buoyancy is greater than the gravitational force G ($F > G$).

Therefore the disc is firmly pressed to the glass cylinder.

Due to the small buoyancy acting on the disc immediately below the water surface, we have $F < G$ there.

Therefore the disc comes off the glass cylinder and falls down.

Remark:

If the glass cylinder is filled with water after immersion, this experiment setup is also suited to demonstrate that the pressure acting on the disc from below equals that acting from above.

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