DENSITY OF A SOLID.

Aim - To find the density of a solid denser than water.
Apparatus - spring balance, stone, measuring jar etc.
Theory - Density of a solid $d = \frac{M}{V}$ where M is the mass and V is the volume.
Procedure - a. To find the vol. of the given solid.

1. Take a measuring cylinder of proper capacity. Fill it with water upto a known volume.
2. Tie the solid by a thin strong thread and hang it fully immersed in water in measuring cylinder.
3. The solid displaces water and waterlevel rises. Note the position of waterlevel keeping the eye in the horizontal position with the level.
4. The difference in two positions of the water level gives the volume of the immersed solid.

b. To find the mass of the given solid.

1. Tie the stone with a fine thread. On the otherend of the thread make a loop.
2. Suspend the stone from the hook of the spring balance. Measure and record its weight. Calculate the density using the equation,

$$d = \frac{M}{V}$$

Result

The density of the stone =

Precautions.

1. Use a sensitive spring balance.
2. Record the zero error in the spring balance.
3. Record the volume of water in the measuring cylinder by keeping the line of sight parallel to the lowest point of concave meniscus.
4. Make sure that no air bubbles are sticking to the stone when immersed in water.

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Vinay C

CLASS IX.

ARCHIMEDES' PRINCIPLE.

AIM – To establish the relation between the loss in weight of a solid when fully immersed in tapwater with the weight of displaced water.

Apparatus – Overflow can, wooden block, beaker, metal cylinder, spring balance, water etc.

Theory – According to Archimedes principle, when a body is partially or fully immersed in a fluid, it experiences an upthrust equal to the weight of the fluid displaced.

Procedure

1. Fill the overflow can with water, till it starts flowing out of its spout.
2. place an empty beaker under the spout to collect water.
3. Weigh a solid in ~~water~~ air with the help of a spring balance. Let it be W_1.
4. Now gradually lower the solid into water in the overflow can, till it is completely immersed. The solid displaces water which overflows through the spout and falls into the preweighed empty beaker.
5. Note the reading of the spring balance as W_2. This is the weight of solid in water.
6. The difference, $W_1 - W_2$ gives the upthrust.
7. Let W_3 be the weight of empty preweighed beaker and W_4, the weight of beaker and collected water
8. The difference $W_4 - W_3$ gives the weight of displaced water alone.

Result

The weight of water collected in the beaker is equal to the loss of weight of solid when it is immersed in water. This verifies Archimedes principle.