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Home Assignment

(1) Mass of empty density bottle = $M_1 = 35g$
Mass when filled with water = $M_2 = 65g$
Mass when filled with alcohol = $M_3 = 59g$
So, mass of alcohol = $59g - 35g = 24g$
So, mass of water = $65g - 35g = 30g$

So, releative density = $\frac{30}{24} = \frac{5}{4} = 1.25$

(2) A density bottle is a type of liquid bottle which store a fixed volume of liquid thus it is used to determine the density of a liquid.

→ When liquid is filled in the density bottle and stopper is inserted in it, the excess water drains out and each time same quantity of liquid is obtained. Thus, density bottle is used to find density of a liquid.

(3)

Density	Relative Density
(1) Density of a liquid is determined as mass of a liquid per its unit volume.	(1) Relative Density is defined as the ratio of the mass of any substance to the mass of water.
(2) Density has units and its S.I unit is gm/cm^3 or Kg/m^3	(2) Relative Density has no units.

(4) Ratio between ~~density~~ mass of aluminium and water is 2:7 or 0.28.
This infers that the mass of aluminium is ~~xx~~ 0.28 times heavier than the mass of the water.

(5) Mass of an empty density bottle = M_1 = 21.8g
Mass of water = M_2 = 41.8g
Mass of liquid = M_3 = 40.6g
So, mass of water displaced = 41.8 - 21.8 = 20g
Mass of liquid displaced = 40.6 - 21.8 = 18.8g

(a) Volume of density bottle = Volume of water = 20g

(b) Relative density of liquid = $\frac{M_3 - M_1}{M_2 - M_1} = \frac{(40.6 - 21.8)g}{(41.8 - 21.8)g} = \frac{18.8}{20}$

$= \frac{36}{25} = 1.44$ $= \frac{188}{10} \times \frac{1}{20}$

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(6) Mass of empty density bottle = M_1 = 22g

Mass of Bottle + Water = 50g = M_2

$\Rightarrow$ 22g + Water = 50g $\Rightarrow$ Mass of water = 50g - 22g = 28g

Mass of Bottle + Brine Solution = 54g = M_3

$\Rightarrow$ 22g + Brine Solution = 54g $\Rightarrow$ Brine Solution = 54g - 22g
= 32g

So, density of a brine solution = $\frac{\text{Mass of Brine Solution}}{\text{Mass of Water}}$

$1g = 1cm^3$

$\Rightarrow 28g = 28cm^3$

$\therefore \frac{32g}{28g\,cm^3} = \frac{8}{7} g/cm^3 = 1.14 g/cm^3$

Relative Density of Brine Solution = 1.14.