

home assignment

Q1) Density of alcohol = 600 kg/m^{-3}
In $\text{g/cm}^3 = \frac{600}{1000} = 0.60 \text{ g/cm}^3$

Q2) (a) Mass of wood = 150 g
volume of wood = 200 cm^3

Density = m/v

$D = 150/200$

$D = 0.75 \text{ g/cm}^3$

(b) In SI unit system = $0.75 \times 1000 = 750 \text{ kg/m}^3$

Q3) Mass of solid (M) = 72 g

Initial volume of water $V_1 = 24 \text{ ml}$

Final volume of water $V_2 = 42 \text{ ml}$

Volume of solid (v) $\Rightarrow V_2 - V_1$

$\Rightarrow 42 - 24 = 18 \text{ cm}^3$

Density of solid (D) $\Rightarrow \frac{M}{v}$
 $= \frac{72}{18} = 4 \text{ g/cm}^3$

Q4) As the temperature increases, volume of most of the liquids also increases and when the volume increases density decreases. Similarly, when temperature decreases, the volume of most liquids decreases which increases the density. However, water shows anomalous behaviour

water has maximum volume at 4-degree celsius and maximum density at 4-degree celsius.

But when water is cooled down further its volume starts increasing and hence, the density of water decreases when cooled further below than 4-degree celsius.

Hence, the density of water is maximum at 4-degree celsius at 1gcm^{-3} or 1000kgm^{-3}

Density bottle is a small glass bottle having a glass stopper at its neck. The bottle can store a fixed volume of a liquid. Generally the volume of bottles is 25ml or 50ml. Stopper has a narrow hole through it. when bottle is filled and stopper is inserted, the excess liquid rises through the hole and drains out. Thus the bottle will contain the same volume of liquid each time when it is filled. It is used to determine the density of a liquid.