

Assignment

1. Define the term density of a substance.

A) The density of a substance is defined as the mass of a unit volume of that substance.

2. Name the S.I unit of density. How is it related to g cm^{-3} ?

A) S.I unit of density is kg m^{-3} .
 $1 \text{ kg m}^{-3} = \frac{1 \text{ kg}}{1 \text{ m}^3} = \frac{1000 \text{ g}}{(100)^3 \text{ cm}^3} = \frac{1}{1000} \text{ g cm}^{-3}$

3. The density of brass is 8.4 g cm^{-3} . What do you mean by this statement?

A) This statement means one cubic centimetre volume of brass has mass of 8.4 g .

4. Arrange the following substance in order of their increasing density; Iron, Cork, Brass, water, mercury

A) Cork, Water, Iron, Brass, Mercury

5. How does the density of a liquid is heated, which of the following quantity

5. How does the density of a liquid or gas vary with temperature.

A) As the temp. increases volumes of most of the liquids also increases and when the volume increases density decreases. Similarly, when temperature decreases, the volume of most liquid decreases which increase the density. However, water shows ~~an~~ anomalous behaviour, water has maximum volume at 4°C and maximum density at 4°C .

But when water is cooled down further its volume starts increasing and hence the density of water decreases when cooled further below than 4°C

Hence, the density of water is maximum at 4°C at 1 g cm^{-3} or 1000 kg m^{-3}

7. Describe an experiment to determine the density of the material of a coin.

$$A) \text{ Density} = \frac{\text{Mass}}{\text{Volume}} = \frac{m}{V}$$

To find the density of the material of a coin, we need to find its mass by common beam balance and its volume by measuring cylinder.

To measure the mass of a coin.

Let the mass of a coin shown by a beam balance = m (gram) = 50 g

To measure the volume

Initial volume of water : $V_1 = 42 \text{ ml}$
Final volume of water

When a coin is added in the cylinder
 $V_2 = 52 \text{ ml}$
 $V_1 - V_2 = 52 - 42 = 10 \text{ ml}$.

8. Describe an experiment to determine the density of a liquid

Ans) Density = $\frac{m}{V}$

We need to find the volume of liquid milk and mass of liquid.

To find the mass of milk

If,

Weight of empty ~~100g~~ beaker = $m_1 \text{ g} = 70 \text{ g}$

Fill the beaker with milk and weight again = $m_2 \text{ g} = 116 \text{ g}$

$$D = \frac{m}{V} = \frac{m_2 - m_1}{40 \text{ C}} = \frac{116 - 70}{40} = \frac{46}{40}$$

$= 4.6 = 1.15 \text{ g cm}^{-3}$