

1) Given:

$$V = 15.0 \text{ ml}$$

$$m = 40.5 \text{ g}$$

$$D = ?$$

Soln: $D = \frac{m}{V}$

$$= \frac{40.5 \text{ g}}{15.0 \text{ ml}}$$

$$D = 2.70 \text{ g/ml}$$

2) Given:

$$V = 22.5 \text{ ml}$$

$$m = 306.0 \text{ g}$$

$$D = ?$$

Soln: $D = \frac{m}{V}$

$$D = \frac{306.0 \text{ g}}{22.5 \text{ ml}}$$

$$D = 13.6 \text{ g/ml}$$

3) Given:

$$V = 200.0 \text{ ml}$$

$$m = ?$$

$$D = 0.789 \text{ g/ml}$$

Soln:

$$D = \frac{m}{V}$$

$$m = D \cdot V$$

$$= (0.789 \text{ g/ml})(200.0 \text{ ml})$$

$$m = 158 \text{ g}$$

4) Given:

$$V = 8.4 \text{ cm} \times 5.5 \text{ cm} \times 4.6 \text{ cm}$$

$$m = 1896 \text{ g}$$

$$D = ?$$

Soln:

$$V = (8.4 \text{ cm})(5.5 \text{ cm})(4.6 \text{ cm})$$
$$= 212.52 \text{ cm}^3$$

$$D = \frac{m}{V} = \frac{1896 \text{ g}}{212.52 \text{ cm}^3}$$

$$D = 8.9 \text{ g/cm}^3$$

5) Given:

$$M_{\text{Flask}} = 345.8 \text{ g}$$

$$V_{\text{CCl}_4} = 225 \text{ mL}$$

$$\text{Mass flask} + \text{CCl}_4 = 703.55 \text{ g}$$

D of $\text{CCl}_4 = ?$

Soln:

$$\begin{aligned} \text{Mass CCl}_4 &= \text{Full flask} - \text{Mass Flask} \\ &= 703.55 \text{ g} - 345.8 \text{ g} \\ &= 357.75 \text{ g} \end{aligned}$$

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

$$= \frac{357.75 \text{ g}}{225 \text{ mL}}$$

$$\boxed{D = 1.59 \text{ g/mL}}$$

6) Given:

$$V = ?$$

$$M = 2500.0 \text{ g}$$

$$D = 10.5 \text{ g/cm}^3$$

Soln:

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

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

$$= \frac{2500.0 \text{ g}}{10.5 \text{ g/cm}^3}$$

$$= 238.1 \text{ cm}^3$$

$$= 238.1 \text{ cm}^3$$

$$1 \text{ mL} = 1 \text{ cm}^3$$

$$\therefore V = 238.1 \text{ mL}$$