

Resolución de los problemas de disoluciones

$$\textcircled{1} \text{ a) } m_D = 20 \text{ g} \quad \left| \quad \text{Porcentaje} = \frac{m_s \cdot 100}{m_D} \Rightarrow \right. \\ \text{Porcentaje} = 30\%$$

$$\Rightarrow m_s = \frac{\text{Porcentaje} \cdot m_D}{100} = \frac{30 \cdot 20}{100} = \frac{600}{100} = \boxed{6 \text{ g}}$$

$$\text{b) } \left. \begin{array}{l} V_D = 30 \text{ cm}^3 \\ c = 12 \frac{\text{g}}{\text{l}} \end{array} \right\} c = \frac{m_s}{V_D} \Rightarrow m_s = c \cdot V_D$$

$$m_s = 12 \frac{\text{g}}{\text{l}} \cdot 0,030 \text{ l} = \boxed{0,36 \text{ g}}$$

$$\text{c) } V_D = \frac{3}{4} \text{ l} \quad \left| \quad \% \text{ volumen} = \frac{V_s \cdot 100}{V_D} \Rightarrow \right. \\ \% \text{ volumen} = 16\%$$

$$\Rightarrow V_s = \frac{\% \text{ volumen} \cdot V_D}{100} = \frac{16 \cdot \frac{3}{4} \text{ l}}{100} =$$

$$= \frac{4 \cdot 3}{100} = \frac{12}{100} = 0,12 \text{ l} = \boxed{120 \text{ ml}}$$

$$\textcircled{2} \text{ a) } V_D = 250 \text{ ml} \quad \left| \quad d_D = \frac{m_D}{V_D} \Rightarrow \right.$$

$$\text{Riqueza} = 7\%$$

$$d_D = 1\frac{1}{3} \frac{\text{g}}{\text{cm}^3} \quad \left| \quad \Rightarrow m_D = d_D \cdot V_D = \right.$$

$$= 1\frac{1}{3} \frac{\text{g}}{\text{cm}^3} \cdot 250 \text{ cm}^3 = 325 \text{ g disolución}$$

$$m_s = \frac{325 \cdot 7}{100} = \boxed{22.75 \text{ g}}$$

$$\text{b) } m_D = d_D \cdot V_D = 1\frac{1}{8} \frac{\text{g}}{\text{cm}^3} \cdot 300 \text{ cm}^3 = 540 \text{ g}$$

$$m_s = \frac{540 \cdot 5}{100} = \boxed{27 \text{ g}}$$

$$\textcircled{3} \text{ a) } \quad \left| \quad c = \frac{m_s}{V_D} \Rightarrow V_D = \frac{m_s}{c} = \right.$$

$$c = 60 \frac{\text{g}}{\text{l}}$$

$$\text{¿} V_D ? \rightarrow \text{ml}$$

$$m_s = 40 \text{ g}$$

$$= \frac{40 \text{ g}}{60 \frac{\text{g}}{\text{l}}} = 0.667 \text{ l} = \boxed{667 \text{ ml}}$$

$$\begin{array}{l|l}
 \text{b) Riqueza} = 40\% \\
 \hat{m}_D? \\
 m_s = 15 \text{ g}
 \end{array}
 \quad
 \begin{array}{l}
 \text{Porcentaje} = \frac{m_s \cdot 100}{m_D} \Rightarrow \\
 \Rightarrow m_D = \frac{m_s \cdot 100}{\text{Porcentaje}} = \\
 = \frac{15 \cdot 100}{40} = \boxed{37.5 \text{ g}}
 \end{array}$$

$$\begin{array}{l|l}
 \text{④ a) } m_s = 120 \text{ g} \\
 m_d = 340 \text{ g} \\
 \hat{Riqueza}?
 \end{array}
 \quad
 \begin{array}{l}
 \text{Riqueza} = \frac{m_s \cdot 100}{m_D} = \\
 = \frac{m_s \cdot 100}{m_s + m_d} = \\
 = \frac{120 \cdot 100}{120 + 340} = \frac{12000}{460} = \boxed{26.1\%}
 \end{array}$$

$$\begin{array}{l|l}
 \text{b) \% volumen} = 30\% \\
 \hat{V}_D? \\
 V_s = 20 \text{ ml}
 \end{array}
 \quad
 \% \text{ volumen} = \frac{V_s \cdot 100}{V_D} \Rightarrow$$

$$\Rightarrow V_D = \frac{V_s \cdot 100}{\% \text{ volumen}} = \frac{20 \cdot 100}{30} = \frac{2000}{30} = \boxed{66.7 \text{ ml}}$$

⑤ $\hat{m}_s$?

$$V_D = 20 \text{ ml} = 0.020 \text{ l}$$

$$s = \frac{m_s}{V_D} \Rightarrow m_s = s \cdot V_D$$

$$a) T = 43^\circ\text{C} \Rightarrow s = 40 \frac{\text{g}}{\text{l}} \Rightarrow m_s = s \cdot V_D =$$

$$= 40 \frac{\text{g}}{\text{l}} \cdot 0.020 \text{ l} = \boxed{0.8 \text{ g}}$$

$$b) T = 62^\circ\text{C} \Rightarrow s = 80 \frac{\text{g}}{\text{l}} \Rightarrow m_s = s \cdot V_D =$$

$$= 80 \frac{\text{g}}{\text{l}} \cdot 0.020 \text{ l} = \boxed{1.6 \text{ g}}$$

$$c) T = 77^\circ\text{C} \Rightarrow s = 140 \frac{\text{g}}{\text{l}} \Rightarrow m_s = s \cdot V_D =$$

$$= 140 \frac{\text{g}}{\text{l}} \cdot 0.020 \text{ l} = \boxed{2.8 \text{ g}}$$

⑥ $m_s = 20 \text{ g}$

$$m_d = 150 \text{ g}$$

$$d_D = 1.1 \frac{\text{g}}{\text{ml}}$$

$\hat{R}$ Riqueza, % volumen?

$$Riqueza = \frac{m_s \cdot 100}{m_D} =$$

$$= \frac{20 \cdot 100}{20 + 150} = \frac{2000}{170} = \boxed{11.8\%}$$

$$V_d = 150 \text{ ml}$$

$$V_D = \frac{m_D}{d_D} = \frac{170 \text{ g}}{1.1 \text{ g/ml}} = 155 \text{ ml}; V_s = V_D - V_d = 155 - 150 = 5 \text{ ml}$$

$$\% \text{ volumen} = \frac{V_s \cdot 100}{V_D} = \frac{5 \cdot 100}{155} = \boxed{323 \%}$$

$$(7) \quad s = \frac{m_s}{V_D} \Rightarrow m_s = s \cdot V_D$$

$$a) \quad T = 30^\circ \text{C} \Rightarrow s = 60 \frac{\text{g}}{\text{l}};$$

$$m_s = s \cdot V_D = 60 \frac{\text{g}}{\text{l}} \cdot 0.15 \text{ l} = \boxed{9 \text{ g}}$$

$$b) \quad T = 60^\circ \text{C} \Rightarrow s = 100 \frac{\text{g}}{\text{l}}$$

$$m_s = s \cdot V_D = 100 \frac{\text{g}}{\text{l}} \cdot 0.15 \text{ l} = \boxed{15 \text{ g}}$$

$$c) \quad T = 75^\circ \text{C} \Rightarrow s = 120 \frac{\text{g}}{\text{l}}$$

$$m_s = s \cdot V_D = 120 \frac{\text{g}}{\text{l}} \cdot 0.15 \text{ l} = \boxed{18 \text{ g}}$$

8) a) $m_s = 12 \text{ dg} = 1/2 \text{ g}$

$V_D = 3 \text{ ml} = 3 \cdot 10^{-3} \text{ l}$

c?

$$c = \frac{m_s}{V_D} = \frac{1/2 \text{ g}}{3 \cdot 10^{-3} \text{ l}} = \boxed{400 \frac{\text{g}}{\text{l}}}$$

b) $m_s = 80 \text{ g}$

$m_d = 240 \text{ g}$

$d_D = 1/2 \frac{\text{kg}}{\text{l}}$

c? Riqueza, c?

$$\text{Riqueza} = \frac{m_s \cdot 100}{m_D} =$$

$$= \frac{m_s \cdot 100}{m_s + m_d} = \frac{80 \cdot 100}{80 + 240} =$$

$$= \frac{8000}{320} = \boxed{25\%}$$

$$d_D = \frac{m_D}{V_D} \Rightarrow V_D = \frac{m_D}{d_D} = \frac{320 \text{ g}}{1/2 \frac{\text{g}}{\text{ml}}} = 267 \text{ ml}$$

$$c = \frac{m_s}{V_D} = \frac{80 \text{ g}}{0.267 \text{ l}} = \boxed{300 \frac{\text{g}}{\text{l}}}$$

$$\textcircled{9} \text{ a) } d_D = 1/3 \frac{\text{g}}{\text{cm}^3} \quad \left| \quad d_D = \frac{m_D}{V_D} \Rightarrow m_D = d_D \cdot V_D = \right.$$

$$\text{Riqueza} = 20\%$$

$$m_s?$$

$$V_D = 375 \text{ ml}$$

$$= 1/3 \frac{\text{g}}{\text{ml}} \cdot 375 \text{ ml} = 487.5 \text{ g}$$

$$\text{Riqueza} = \frac{m_s \cdot 100}{m_D} \Rightarrow$$

$$\Rightarrow m_s = \frac{\text{Riqueza} \cdot m_D}{100} = \frac{20 \cdot 487.5}{100} = \boxed{97.5 \text{ g}}$$

$$\text{b) } \text{Riqueza} = 40\% \quad \left| \quad m_D = d_D \cdot V_D = 1/4 \frac{\text{g}}{\text{cm}^3} \cdot 500 \text{ cm}^3 = \right.$$

$$d_D = 1/4 \frac{\text{g}}{\text{cm}^3}$$

$$m_s?$$

$$V_D = 0.5 \text{ l}$$

$$= 700 \text{ g}$$

$$m_s = \frac{700 \cdot 40}{100} = \boxed{280 \text{ g}}$$

$$(10) \quad m_s = 50 \text{ g}$$

$$m_d = 230 \text{ g}$$

$$d_D = 1.1 \frac{\text{g}}{\text{cm}^3}$$

¿Riqueza, % volumen?

$$a) \text{ Riqueza} = \frac{m_s \cdot 100}{m_D} = \frac{m_s \cdot 100}{m_s + m_d} =$$

$$= \frac{50 \cdot 100}{50 + 230} = \frac{5000}{280} = \boxed{17.9 \%}$$

$$b) \% \text{ volumen} = \frac{V_s \cdot 100}{V_D}$$

$$d_D = \frac{m_D}{V_D} \Rightarrow V_D = \frac{m_D}{d_D} = \frac{280 \text{ g}}{1.1 \frac{\text{g}}{\text{cm}^3}} = 255 \text{ cm}^3$$

$$V_d = 230 \text{ ml}$$

$$V_s = V_D - V_d = 255 - 230 = 25 \text{ ml}$$

$$\% \text{ volumen} = \frac{V_s \cdot 100}{V_D} = \frac{25 \cdot 100}{255} = \boxed{9.8 \%}$$