

1. Obtenga la fórmula empírica y molecular si hay carbono 40%, hidrógeno 4%, nitrógeno 22,4%, Azufre 12,8%, oxígeno 12,8% y masa de 1000g.

2. Obtenga la fórmula empírica y molecular si hay carbono 40%, hidrógeno 6,7% y oxígeno 53,3% con una masa de 90g.

Solución

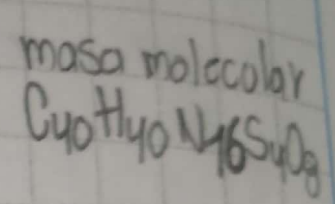
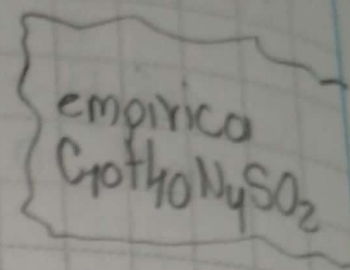
mol C = $\frac{48g}{12g/mol} = 4$ mol $0,4/4 = 10$

mol H = $\frac{4g}{1g/mol} = 4$ mol $0,4/4 = 10$

mol N = $\frac{22,4g}{14g/mol} = 1,6$ mol $1,6/0,4 = 4$

mol S = $\frac{12,8g}{32g/mol} = 0,4$ mol $0,4/0,4 = 1$

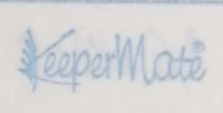
mol O = $\frac{12,8g}{16g/mol} = 0,8$ mol $0,8/0,4 = 2$



$\frac{1000g}{250} = 4$

C = 12 x 10 = 120	C = 4 x 10 = 40
H = 1 x 10 = 10	H = 4 x 10 = 40
N = 14 x 4 = 56 = 250	N = 4 x 4 = 16
S = 32 x 1 = 32	S = 4 x 1 = 4
O = 16 x 2 = 32	O = 4 x 2 = 8

C = 4 x 10 = 40
H = 4 x 10 = 40
N = 4 x 4 = 16
S = 4 x 1 = 4
O = 4 x 2 = 8



$$2, \text{ mol } C = \frac{40 \text{ g}}{12 \text{ g/mol}} = 3,33$$

$$\text{mol } 3,33/3,33 = 1$$

$$\text{mol } H = \frac{6,7 \text{ g}}{1 \text{ g/mol}} = 6,7$$

$$\text{mol } 6,7/3,33 = 2$$

$$\text{mol } O = \frac{53,3 \text{ g}}{16 \text{ g/mol}} = 3,33$$

$$\text{mol } 3,33/3,33 = 1$$

empirica = CH_2O

$$\frac{90 \text{ g}}{30} = 3$$

$$\begin{aligned} C &= 12 \times 1 = 12 \\ H &= 1 \times 2 = 2 \\ O &= 16 \times 1 = 16 \\ &30 \end{aligned}$$

$$\begin{aligned} C &= 3 \times 1 = 3 \\ H &= 3 \times 2 = 6 \\ O &= 3 \times 1 = 3 \end{aligned}$$

masa molecular = $\text{C}_3\text{H}_6\text{O}_3$