$$\uparrow^{L.R.} \quad (1) \overline{)\begin{array}{c} 2.27 \\ 95 \\ 22 \\ 30 \\ 99 \\ 80 \end{array}}$$

100 g of propane is completely reacted with 1000 g of oxygen. The mole fraction of carbon dioxide in the resulting mixture is $\underline{x} \times 10^{-2}$. The value of x is ...23...
(Nearest integer) [Atomic weight: H 1.008, C = 12.00, O = 16.00]

$$1\ C_3H_8(g) + 5\ O_2(g) \rightarrow 3\ CO_2(g) + 4\ H_2O(g)$$

$$n = \frac{100}{44} = 2.27 \qquad \frac{1000}{32} = 31.25$$

$$2.27 \times 5 = 11.35g \qquad 2.27 \times 3 \qquad 2.27 \times 4 = 9.08$$
$$\text{react} \qquad = 8.81$$

$$n_{O_2} \text{ left} = 31.25 - 11.35$$
$$= 19.9$$

$$\chi_{CO_2} = \frac{n_{CO_2}}{n_{CO_2} + n_{H_2O} + n_{O_2} \text{ left}}$$

$$= \frac{8.81}{8.81 + 9.08 + 19.9}$$

$$= \frac{8.81}{37.79}$$

$$= 0.23 = 23 \times 10^{-2} = x \times 10^{-2}$$

$$x = 23$$

Wood's metal contains 50.0% bismuth, 25.0% lead, 12.5% tin and 12.5% cadmium by weight. What is the mole fraction of tin?

(Atomic weights: Bi = 209, Pb = 207, Sn = 119, Cd = 112)

(A) 0.202

(B) 0.158

(C) 0.176

(D) 0.221

$$x_{tin} = \frac{n_{tin}}{n_{tin} + n_{Bi} + n_{Pb} + n_{Cd}}$$

$$= \frac{0.105}{0.105 + 0.24 + 0.12 + 0.11}$$

$$= \frac{0.105}{0.575}$$

$$= 0.18$$

$$n_{tin} = \frac{12.5}{119} = 0.105$$

$$n_{Bi} = \frac{50}{209} = 0.24$$

$$n_{Cd} = \frac{12.5}{112} = 0.11$$

$$n_{Pb} = \frac{25}{207} = 0.12$$

A commercially sold conc. HCl is 35% by mass. If the density of this commercial acid is 1.46 g/mL, the molarity of this solution is :

(Atomic mass : Cl = 35.5 amu, H = 1 amu)

$$M = \frac{35 \times 14.6}{36.5} = 14\ M$$

(A) 10.2 M

(B) 12.5 M

(C) 14.0 M

(D) 18.2 M

$$1 + 14 + 3 \times 16 = 63$$

The molarity of HNO_3 in a sample which has density 1.4 g/mL and mass percentage of 63% is _____ . (Molecular Weight of $HNO_3 = 63$)

$$M = \frac{63 \times 1.4 \times 10}{63} = 14 \, M$$

C_2H_5OH

H_2O

138 g of ethyl alcohol is mixed with 72 g of water. The ratio of mole fraction of ethyl alcohol to water is if molar mass of ethyl alcohol is 46 g and of water is 18 g.

(A) 3 : 4

(B) 1 : 2

(C) 1 : 4

(D) 1 : 1

$$\frac{\chi_{0_{C_2H_5OH}}}{\chi_{0_{H_2O}}} = \frac{n_{C_2H_5OH}}{n_{H_2O}} = \frac{138^{3} \times 18}{46 \times 72_{4}} = \frac{3}{4}$$

The molarity of the solution prepared by dissolving 6.3 g of oxalic acid ($H_2C_2O_4.2H_2O$) in 250 mL of water in mol L^{-1} is $x \times 10^{-2}$. The value of x is __20__. (Nearest integer) [Atomic mass: H : 1.0, C : 12.0, O : 16.0]

$$M = \frac{n_B}{V(L)}$$

$$= \frac{6.3 \times 1000}{126 \times 250 \times 10} = \frac{2}{10} = 0.2 = \frac{2 \times 10^{-1}}{10}$$

$$\times 10 = 20 \times 10^{-2} = x \times 10^{-2}$$

$$x = 20$$

THANK YOU