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Answer to question No:1(a)

An ideal gas is one that follows the gas laws at all conditions of temperature & pressure.

On the other hand, a real gas is a gas that does not behave according to the assumptions of the kinetic molecular theory. But, fortunately in laboratory, real gas tend to behave very much like an ideal gases.

Answer to question NO: 1(b).

Given,

Mass of  $\text{NH}_3$ ,  $w = 7.40 \text{ g}$ .

Molar mass of  $\text{NH}_3$ ,  $M = 17 \text{ g/mol}$ .

$$\therefore \text{Number of moles, } n = \frac{w}{M} = \frac{7.4}{17} \text{ mol} \\ = 37/85 \text{ mol.}$$

Molar volume of gas,  $V_m = 22.4 \text{ Lit}$ .

$$\therefore \text{Volume occupied by } 7.4 \text{ g of } \text{NH}_3, V = n \times V_m \\ \Rightarrow \left( \frac{37}{85} \times 22.4 \right) \text{ Litres} \\ = 9.75 \text{ Lit.}$$

Answer to question No:1(c).

The equation for the density of a gas is:

$$\rho = \frac{MP}{RT}$$

Here,

M = molar mass of gas (for  $\text{CO}_2$ , this is  $44.01 \text{ g/mol}$ ).

P = pressure exerted ( $0.990 \text{ atm}$ )

R = universal gas constant ( $0.082057 \frac{\text{L}\cdot\text{atm}}{\text{mol}\cdot\text{K}}$ )

T = absolute temperature ( $55 + 273 = 328 \text{ K}$ )

$$\begin{aligned} \text{So, } \rho &= \frac{44.01 \times 0.990}{0.082057 \times 328} \quad \text{g/L} \\ &= 1.6198 \text{ g/L} \end{aligned}$$

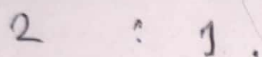
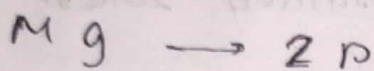
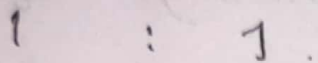
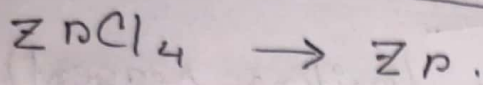
Ans



Answer. to question No: 2(a).

The limiting reagent (or limiting reagent) is the reactant that is entirely consumed when a reaction goes to completion.

Answer to question NO: 2(b).



Therefore, Mg is the limiting reagent.

$$2 \times 10^7 \times \frac{1}{24} \times \frac{1}{2} = 4.167 \times 10^5 \text{ mol of Zn}$$

mol  $\rightarrow$  grams of Zn.

$$4.167 \times 10^5 \times 65$$

$$= 2.70825 \times 10^7 \text{ g}$$

$$\% \text{ yield} = \frac{\text{actual yield}}{\text{theoretical yield}} \times 100$$

$$= \frac{7.9 \times 10^6}{3.8 \times 10^7} \times 100$$

$$= 20.789\%$$