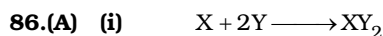


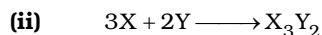
Daily Tutorial Sheet-7

Level - 2



$$0.1 \text{ mol of } XY_2 = 10 \text{ g}$$

$$1 \text{ mol of } XY_2 = 100 \text{ g}$$



$$0.05 \text{ mol of } X_3Y_2 = 9 \text{ g}$$

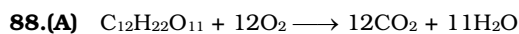
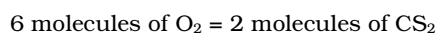
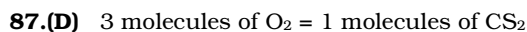
$$1 \text{ mol of } X_3Y_2 = \frac{9}{0.05} = 180 \text{ g}$$

$$\therefore \begin{array}{l} X + 2Y = 100 \\ 3X + 2Y = 180 \end{array} \left\{ \begin{array}{l} \text{MW of } XY_2 = 100 \\ \text{MW } X_3Y_2 = 180 \end{array} \right.$$

Solve for X and Y

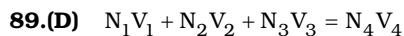
$$X = 40 \text{ g}$$

$$Y = 30 \text{ g}$$



1 mole of starch requires 12 moles of oxygen

$$\therefore \frac{34}{342} \text{ moles of starch requires } \frac{34}{342} \times 12 \times 32 \times 24 = 916.2 \text{ gm}$$

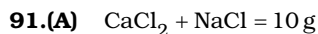
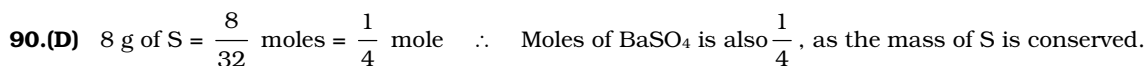


$$(V_4 = V_1 + V_2 + V_3 + V_4) \text{ or}$$

$$V_4 = \text{Final volume} = 1 \text{ L} = 1000 \text{ mL}$$

$$5 \times N + 20 \times \frac{N}{2} + 30 \times \frac{N}{3} = N_4 \times 1000$$

$$\therefore N_4 = \frac{N}{40}$$



Let weight of $CaCl_2 = x \text{ g}$



$$1 \text{ mol} \quad 1 \text{ mol} \quad 1 \text{ mol}$$

$$\frac{x}{111} \text{ mol} \quad \frac{x}{111} \text{ mol} \quad \frac{x}{111} \text{ mol}$$

$$\text{Mole of } CaO = \frac{1.62}{56}$$

$$\therefore \frac{x}{111} = \frac{1.62}{56} \Rightarrow x = 3.21 \text{ g}$$

$$\% \text{ of } CaCl_2 = \frac{3.21}{10} \times 100 = 32.1\%$$

92.(B) Weight of salt = 13.4 g

Weight of H_2O = 6.3 g

Weight of anhydrous salt = $13.4 - 6.3 = 7.1$ g

Moles of anhydrous salt = $\frac{7.1}{142} = 0.05$

Moles of H_2O = $\frac{6.3}{18} = 0.35$ mol

0.05 mol of anhydrous $\Rightarrow$ salt 0.35 mol of H_2O

For 1 mole $\Rightarrow$ 7 mole H_2O

93.(D) $\text{MCO}_3 \longrightarrow \text{MO} + \text{CO}_2 \uparrow$

$\text{M}'\text{CO}_3 \longrightarrow \text{M}'\text{O} + \text{CO}_2 \uparrow$

Equation of CO_2 = Equation of carbonates of metals

1 mol of CO_2 = 1 mol of CO_3^{2-}

44 g of CO_2 = 60 g of CO_3^{2-}

1.10 g of CO_2 = $\frac{60}{44} \times 1.10 = 1.5$ g of CO_3^{2-}

% of CO_3^{2-} = $\frac{1.5 \times 100}{3} = 50\%$

% of one metal = 15%

% of another metal = $100 - 50 - 15 = 35\%$

94.(B) Since no water added, so volume of solution cannot exceed 2 L. So, less concentrated solution should be taken in its total volume.

Only the small portion of more concentrated solution is to be mixed, so that the total concentrated is less than (0.3 M HCl).

Let x L of 0.3 M solution is mixed.

Total volume = (x + 1) L

$M_1V_1 + M_2V_2 = M_3V_3$ [$V_3 = (1 + x)L$]

$0.3 \times xL + 0.15 \times 1L = M_3(1 + x)L$

Final molarity = 0.2 M

$0.3x + 0.15 = 0.2(1 + x)$

X = 0.5 L

Maximum volume = $1 + 0.5 = 1.5$ L

95.(C) $2\text{Fe}(\text{NO}_3)_2 + 3\text{Na}_2\text{CO}_3 \longrightarrow \text{Fe}_2(\text{CO}_3)_3 + 6\text{NaNO}_3$

mole	2.5	3.5
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mole/stoichiometric coefficient	1.25	1.2
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Limiting reagent is Na_2CO_3 so moles of NaNO_3 formed = $3.6 \times 2 = 7.2$

% yield = $\frac{6.3}{7.2} \times 100 = 87.5$