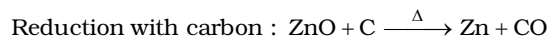
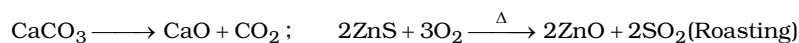


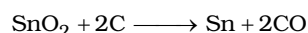
16. (A) → P ; (B) → Q ; (C) → P, R ; (D) → P, S

Sulphides of Cu, Pb, when roasted in air are converted partially into their oxides. On further roasting in the absence of air, self reduction takes place.

Calcination is used when concentrated ore is in the form of hydroxide or carbonate, volatile matter is burnt away.

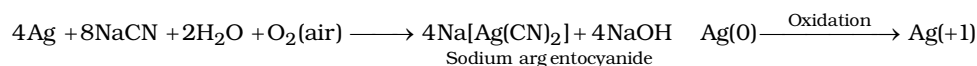


- 17.(ACD) Tin is extracted from cassiterite ore. It is reduced by carbon.

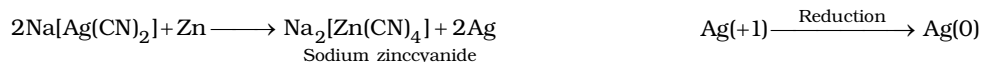


Crude metal contains impurities of Fe, W and Cu.

- 18.(B) Silver ore is oxidised by using oxygen from air as follows :



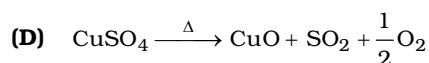
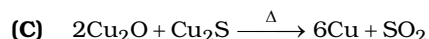
Silver is precipitated from the solution by addition of Zn powder in a finely divided condition.



- 19.(A) Sulphide ore of Ag → Silver glance ( $\text{Ag}_2\text{S}$ ) : Cu → Copper pyrites ( $\text{CuFeS}_2$ ) and Pb → Galena ( $\text{PbS}$ ).

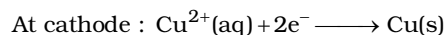
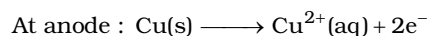
- 20.(CD)  $\text{Al}_2\text{O}_3$  and  $\text{MgCO}_3 \cdot \text{CaCO}_3$  are reduced by electrolytic reduction method.

- 21.(BCD) (A)  $\text{CuFeS}_2 + \text{Cu}_2\text{S} \xrightarrow{\Delta} \text{No reaction}$  (B)  $2\text{CuO} \xrightarrow{\Delta} \text{Cu}_2\text{O} + \frac{1}{2}\text{O}_2$



Both CuO and  $\text{CuSO}_4$  upon heating produces  $\text{Cu}_2\text{O}$  and CuO respectively and further  $\text{Cu}_2\text{O}$  and CuO on heating with  $\text{Cu}_2\text{S}$  gives Cu.

- 22.(BCD) (A) Impure copper is made the anode and a thin sheet of pure copper is made the cathode, while copper sulphate solution acidified with sulphuric acid is taken as the electrolyte. Pure copper deposits at cathode and impurities settle as anode-mud.



23. (A) → (P, Q and S)

Carbonate ores are



(B) → (T)



**(C) → (Q and R)**

Hydroxide ion is present in

(Q) Malachite :  $\text{CuCO}_3 \cdot \text{Cu(OH)}_2$

(R) Bauxite :  $\text{Al}_2\text{O}_3 \cdot 2\text{H}_2\text{O}$

**(D) → (R)**

Oxide ore is bauxite only.

**24.(ABC) (A)** In the extraction of copper from copper pyrites ( $\text{CuFeS}_2$ ), after crushing, concentration of ore is done by froth floatation process.

**(B)** Iron is removed as slag  $\text{FeO} + \text{SiO}_2 \longrightarrow \underset{\text{Slag}}{\text{FeSiO}_3}$

**(C)** Auto-reduction  $2\text{Cu}_2\text{O} + \text{Cu}_2\text{S} \longrightarrow \underset{\text{Blister copper}}{6\text{Cu}} + \text{SO}_2$

**(D)** Blister copper is finally purified by electrolytic refining.

**25.(6.47)**  $2\text{PbS} + 3\text{O}_2 \longrightarrow 2\text{PbO} + 2\text{SO}_2$

$2\text{PbO} + \text{PbS} \longrightarrow 3\text{Pb} + \text{SO}_2$

3moles of  $\text{O}_2$  produce 3 moles of lead.

96 kg of oxygen produced 621 kg of lead.

1 kg of oxygen produced  $\frac{621}{96} = 6.468 = 6.47 \text{ kg}$

**26.(B)** Calamine  $\rightarrow \text{ZnCO}_3$  Malachite  $\rightarrow \text{CuCO}_3 \cdot \text{Cu(OH)}_2$

Magnetite  $\rightarrow \text{Fe}_3\text{O}_4$  Cryolite  $\rightarrow \text{Na}_3\text{AlF}_6$

**27.(ACD)**  $\text{Au} \xrightarrow[\text{+H}_2\text{O}]{\text{NaCN, O}_2 \text{ (Q)}} \underset{\text{(R)}}{\text{Na[Au(CN)}_2\text{]}} \xrightarrow[\text{(T)}]{\text{Zn}} \text{Au} \downarrow + \underset{\text{(Z)}}{\text{Na}_2[\text{Zn(CN)}_4\text{]}}$