

SOLUTION TEST-B

1. Froth floatation method is used for the concentration of sulphide ores. Siderite is FeCO_3 and cannot be concentrated by Froth floatation method.



The correct answer is (i)

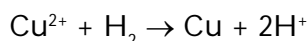
2. **The incorrect pair is given in answer (iv)**

Zone refining is used for the purification of semiconductors, Si and Ge.

3. The metals high in the reactivity series (highly reactive metals) are obtained by using electrolytic reduction method.

The correct answer is (iii)

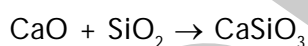
4. Both statements are correct. But reason is not the correct explanation. The correct answer is (ii). Low grade copper ores are first leached with acid or bacteria and then we use H_2 as a reducing agent (hydrometallurgy)



5. Iron obtained from blast furnace is called pig iron and not cast iron. Pig iron contains about 4% carbon and many impurities like S, P. Si, Mn in smaller amounts.

The correct answer is (iv).

6. Lime stone on heating decompose to give calcium oxide. Calcium oxide act as a basic flux to remove acidic gangue SiO_2 as a slag.

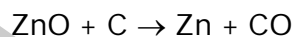


flux gangue calcium silicate

7. Hydraulic washing is based on the difference in the gravities of the ore and the gangue particles.

8. (i) This is because hydrogen is above copper in the activity series and can displace copper from its solution.

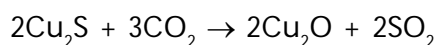
(ii) Only the reaction of zinc oxide with coke has a Δ_rG° negative



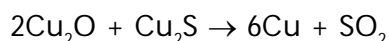
9. Copper (I) sulphide, is Cu_2S

Step-(i): Froth floatation

Step-(ii): Roasting



Step-(iii): Auto reduction



Step-(iv): Electrolyt refining of copper.

10. (i) Lower part: Coke (ii) Cu_2S (iii) Aluminium
Upper part: Carbon monoxide
11. (i) Iodine convert the metal Zr/Ti into its covalent volatile iodide ZrI_4 or TiI_4
(ii) Cresol act as a froth stabiliser.
(iii) Fluorspar lowers the melting point of Al_2O_3 and enhances conductivity.
12. (i) Nickel combines with a stream of CO to form a volatile complex $\text{Ni}(\text{CO})_4$ which then decompose at a higher temperature to give a Pure nickel.



- (ii) In electrolyte refining, impure metal act as anode and strip of pure metal is used as cathode. Electrolyte is used is a solute metal salt. The more basic metal remains in the solution and the less basic ones go to the anode mud. It is used for refining of copper.
- (iii) Iron obtained form the blast furnace is called pig iron and contain about 4% carbon and other impurities cast iron is obtained by melting pig iron with iron scrap and coke using hot air blast. Cast iron has about 3% carbon content.
13. (i) Froth floatation process is based on the difference is the wettability of ore and and the gangue particles. This method is used for concentration of sulphide ores.
(ii) Chromatographic method is based on the principle that different components of a mixture are differently adsorbed on an adsorbent. The mixture is put in liquid or gaseous medium which is moved through the adsorbent. Different components are adsorbed at different lends on the column.
(iii) Distillation is very useful for low boiling metals like zinc and mercury. The impure metal is evaporated to obtain the pure metal as distillate.
14. (i) Cast iron contains about 3% carbon which makes it hard, brittle and difficult to weld.
(ii) Na and Mg are highly reactive metals and have very high affinity for oxygen No chemical reducing agent can reduce their oxides or halides to metal. That is why only electrolytic reduction is useful.
(iii) Copper is extracted by hydrometallurgy from low grade org. It is leached out using acid or bacteria. The solution containing Cu^{2+} is treated with scrap iron or H_2 .



15. (a) The process is Mac-Arther cyanide process

$$4\text{Au} + 8\text{NaCN} + 2\text{H}_2\text{O} + \text{O}_2 \rightarrow 4\text{Na} [\text{Au}(\text{CN})_2] + 4\text{NaOH}$$

$$2\text{Na} [\text{Au}(\text{CN})_2] + \text{Zn} \rightarrow 2\text{Au} + \text{Na}_2 [\text{Zn}(\text{CN})_4]$$
- (b) The impurities present in the anode mud are antimony, selenium, silver, gold and platinum. They are so present because these impurities are less basic in nature.
- (c) The solidified copper obtained by the reduction of Cu_2O using Cu_2S is called blister copper. It is called blister copper due to entrapped SO_2 gas.

