CBSE Class 12 physics
Important Questions
Chapter 6
General Principles and Processes of Isolation of Elements

1 Marks Questions

1. What is pig iron?

Ans. The iron which is obtained from blast furnace and contains about 4% carbon and many other impurities in smaller amounts like S, P, Si, Mn etc, is called pig iron.

2. What is cast iron?

Ans. Iron obtained by melting pig iron with scrap iron and coke using hot air blast is cast iron.

3. What is wrought iron?

Ans. Wrought iron and malleable iron is the purest form of commercial iron which is prepared from cast iron by oxidizing impurities in a reverberatory furnace lined with heamatite.

4. What is added as flux in extraction of iron?

Ans. Limestone is used as flux in extraction of iron.

5. What is Blister copper?

Ans. The solidified copper obtained after extraction has blistered appearance due to evolution of SO_2 is called blister copper.

6. Write the equation for reduction of zinc oxide?

Ans. The reduction of zinc-oxide is done using coke.

$$ZnO + C \xrightarrow{COKE,673\,K} Zn + CO$$

7. Why is cryolite used during extraction of Aluminum?

Ans. Cryolite is used to lower the melting point of alumina and increase conductivity.

8. How is copper extracted from low grade ores?

Ans. Copper is extracted by hydrometallurgy from low grade ores. It is leached out using acid or bacteria.

9. State one limitation of Ellingham diagrams.

Ans. Ellingham diagrams only tell us about the feasibility of a reaction. They do not tell anything about the reaction kinetics.

10. Give an example of extraction based on oxidation reduction.

Ans. An example based on extraction by oxidation is extraction of chlorine from brine.

11. Which method is used for refining of silicon or gallium?

Ans. The refining of Silicon or gallium is done by Zone refining.

12. What is the principle behind zone refining?

Ans. The principle of zone refining is that impurities are more soluble in the melt then in the solid state of the metal.

13. Predict conditions under which Al might be expected to reduce MgO.

Ans. Above $1350°C$, the standard Gibbs free energy of formation of Al_2O_3 from Al is less than that of MgO from Mg. Therefore, above $1350°C$, Al can reduce MgO.

14. What is the role of cryolite in the metallurgy of aluminium?

Ans. Cryolite (Na3AlF6) has two roles in the metallurgy of aluminium:

1. To decrease the melting point of the mixture from 2323 K to 1140 K.
2. To increase the electrical conductivity of Al_2O_3.

15. Why is zinc not extracted from zinc oxide through reduction using CO?

Ans. The standard Gibbs free energy of formation of ZnO from Zn is lower than that of CO_2 from CO. Therefore, CO cannot reduce ZnO to Zn. Hence, Zn is not extracted from ZnO through reduction using CO.