

# General Principles and Processes of Isolation of Elements

## Short Answer Type Questions

1. Why is an external emf of more than 2.2V required for the extraction of  $\text{Cl}_2$  from brine?
2. At temperatures above 1073K coke can be used to reduce  $\text{FeO}$  to  $\text{Fe}$ . How can you justify this reduction with Ellingham diagram?
3. Wrought iron is the purest form of iron. Write a reaction used for the preparation of wrought iron from cast iron. How can the impurities of sulphur, silicon and phosphorus be removed from cast iron?
4. How is copper extracted from low grade copper ores?
5. Write two basic requirements for refining of a metal by Mond process and by Van Arkel Method.
6. Although carbon and hydrogen are better reducing agents but they are not used to reduce metallic oxides at high temperatures. Why?
7. How do we separate two sulphide ores by Froth Floatation Method? Explain with an example.
8. The purest form of iron is prepared by oxidising impurities from cast iron in a reverberatory furnace. Which iron ore is used to line the furnace? Explain by giving reaction.
9. The mixture of compounds A and B is passed through a column of  $\text{Al}_2\text{O}_3$  by using alcohol as eluant. Compound A is eluted in preference to compound B. Which of the compounds A or B, is more readily adsorbed on the column?
10. Why is sulphide ore of copper heated in a furnace after mixing with silica?
11. Why are sulphide ores converted to oxide before reduction?
12. Which method is used for refining Zr and Ti? Explain with equation.
13. What should be the considerations during the extraction of metals by electrochemical method?
14. What is the role of flux in metallurgical processes?
15. How are metals used as semiconductors refined? What is the principle of the method used?
16. Write down the reactions taking place in Blast furnace related to the metallurgy of iron in the temperature range 500-800 K.
17. Give two requirements for vapour phase refining.
18. Write the chemical reactions involved in the extraction of gold by cyanide process. Also give the role of zinc in the extraction.

## Long Answer Type Questions

1. Explain the following :

- (a)  $\text{CO}_2$  is a better reducing agent below 710K whereas CO is a better reducing agent above 710K.
- (b) Generally sulphide ores are converted into oxides before reduction.
- (c) Silica is added to the sulphide ore of copper in the reverberatory furnace.
- (d) Carbon and hydrogen are not used as reducing agents at high temperatures.
- (e) Vapour phase refining method is used for the purification of Ti.