20 General Principles and Processes of Isolation of Elements

1. Extraction of gold and silver involves leaching with CN^- ion. Silver is later recovered by
(a) distillation (b) zone refining
(c) displacement with Zn (d) liquation
(NEET 2017)

2. Match items of Column I with the items of Column II and assign the correct code :

Column I	Column II
(A) Cyanide process	(i) Ultrapure Ge
(B) Froth floatation process	(ii) Dressing of ZnS
(C) Electrolytic reduction	(iii) Extraction of Al
(D) Zone refining	(iv) Extraction of Au
	(v) Purification of Ni

Code :

	A	B	C	D
(a)	(i)	(ii)	(iii)	(iv)
(b)	(iii)	(iv)	(v)	(i)
(c)	(iv)	(ii)	(iii)	(i)
(d)	(ii)	(iii)	(i)	(v)

(NEET-I 2016)

3. In the extraction of copper from its sulphide ore, the metal is finally obtained by the reduction of cuprous oxide with
(a) carbon monoxide
(b) copper (I) sulphide
(c) sulphur dioxide
(d) iron (II) sulphide. *(2015, 2012)*

4. "Metals are usually not found as nitrates in their ores." Out of the following two (I and II) reasons which is/are true for the above observation?
I. Metal nitrates are highly unstable.
II. Metal nitrates are highly soluble in water.
(a) I is false but II is true.
(b) I is true but II is false.
(c) I and II are true.
(d) I and II are false *(2015, Cancelled)*

5. Roasting of sulphides gives the gas *X* as a byproduct. This is a colourless gas with choking smell of burnt sulphur and causes great damage to respiratory organs as a result of acid rain. Its aqueous solution is acidic, acts as a reducing agent and its acid has never been isolated.
The gas *X* is
(a) CO_2 (b) SO_3
(c) H_2S (d) SO_2
(NEET 2013)

6. The metal oxide which cannot be reduced to metal by carbon is
(a) Al_2O_3 (b) PbO
(c) ZnO (d) Fe_2O_3
(Karnataka NEET 2013)

7. Aluminium is extracted from alumina (Al_2O_3) by electrolysis of a molten mixture of
(a) $Al_2O_3 + HF + NaAlF_4$
(b) $Al_2O_3 + CaF_2 + NaAlF_4$
(c) $Al_2O_3 + Na_3AlF_6 + CaF_2$
(d) $Al_2O_3 + KF + Na_3AlF_6$ *(2012)*

8. Which one of the following is a mineral of iron?
(a) Malachite (b) Cassiterite
(c) Pyrolusite (d) Magnetite
(2012)

9. Which of the following elements is present as the impurity to the maximum extent in the pig iron?
(a) Manganese (b) Carbon
(c) Silicon (d) Phosphorus
(2011)

10. Which of the following pairs of metals is purified by van Arkel method?
(a) Ga and In (b) Zr and Ti
(c) Ag and Au (d) Ni and Fe
(2011)

11. The following reactions take place in the blast furnace in the preparation of impure iron. Identify the reaction pertaining to the formation of the slag.

(a) $Fe_2O_{3(s)} + 3CO_{(g)} \rightarrow 2Fe_{(l)} + 3CO_{2(g)}$

(b) $CaCO_{3(s)} \rightarrow CaO_{(s)} + CO_{2(g)}$

(c) $CaO_{(s)} + SiO_{2(s)} \rightarrow CaSiO_{3(s)}$

(d) $2C_{(s)} + O_{2(g)} \rightarrow 2CO_{(g)}$ *(Mains 2011)*

12. Sulphide ores of metals are usually concentrated by froth floatation process. Which one of the following sulphide ores offer an exception and is concentrated by chemical leaching?

(a) Galena (b) Copper pyrite

(c) Sphalerite (d) Argentite

(2007)

13. Which of the following statements, about the advantage of roasting of sulphide ore before reduction is not true?

(a) The ΔG_f° of the sulphide is greater than those for CS_2 and H_2S.

(b) The ΔG_f° is negative for roasting of sulphide ore to oxide.

(c) Roasting of the sulphide to the oxide is thermodynamically feasible.

(d) Carbon and hydrogen are suitable reducing agents for metal sulphides.

(2007)

14. The method of zone refining of metals is based on the principle of

(a) greater mobility of the pure metal than that of the impurity

(b) higher melting point of the impurity than that of the pure metal

(c) greater noble character of the solid metal than that of the impurity

(d) greater solubility of the impurity in the molten state than in the solid

(2003)

15. Cassiterite is an ore of

(a) Sb (b) Ni

(c) Mn (d) Sn

(1999)

16. Purification of aluminium, by electrolytic refining, is known as

(a) Hoope's process

(b) Bayer's process

(c) Hall's process

(d) Serpeck's process *(1999)*

17. Calcium is obtained by

(a) reduction of calcium chloride with carbon

(b) electrolysis of molten anhydrous calcium chloride

(c) roasting of limestone

(d) electrolysis of solution of calcium chloride in H_2O. *(1997)*