1. In the commercial electrochemical process for aluminium extraction, the electrolyte used as:

[JEE-1999]

(1) $Al(OH)_3$ in NaOH solution

(2) an aqueous solution of $Al_2(SO_4)_3$

(3) a molten mixture of Al_2O_3 and Na_3AlF_6

(4) a molten mixture of AlO(OH) and $Al(OH)_3$

2. Electrolytic reduction of alumina to aluminium by Hall-Heroult process is carried out:

[IIT-2000]

(1) in the presence of NaCl

(2) in the presence of fluorite

(3) in the presence of cryolite which forms a melt with lower melting temperature

(4) in the presence of cryolite which forms a melt with higher melting temperature

3. The chemical composition of "slag" formed during the smelting process in the extraction of copper is:

[IIT-2001]

(1) $Cu_2O + FeS$ (2) $FeSiO_3$

(3) $CuFeS_2$ (4) $Cu_2S + FeO$

4. Aluminium is extracted by the electrolysis of :-

[AIEEE-2002]

(1) Bauxite

(2) Alumina

(3) Alumina mixed with molten cryolite

(4) Molten cryolite

5. Pyrolusite is a/an :- **[AIEEE-2002]**

(1) Oxide ore

(2) Sulphide ore

(3) Carbide ore

(4) Not an ore

6. Which of the following processes is used in extractive metallurgy of magnesium?

[IIT-2002]

(1) Fused salt electrolysis

(2) Self reduction

(3) Aqueous solution electrolysis

(4) Thermite reduction

7. In the process of extraction of gold,

[IIT-2003]

$$\text{Roasted gold ore} + CN^- + H_2O \xrightarrow{O_2} [X] + OH^-$$

$$[X] + Zn \longrightarrow [Y] + Au$$

Identify the complexes [X] and [Y] :

(1) $X = [Au(CN)_2]^-$, $Y = [Zn(CN)_4]^{2-}$

(2) $X = [Au(CN)_4]^{3-}$, $Y = [Zn(CN)_4]^{2-}$

(3) $X = [Au(CN)_2]^-$, $Y = [Zn(CN)_6]^{4-}$

(4) $X = [Au(CN)_4]^-$, $Y = [Zn(CN)_4]^{2-}$

8. Which one of the following ores is best concentrated by froth-flotation method :

[AIEEE-2004]

(1) Galena (2) Cassiterite

(3) Magnetite (4) Malachite

9. The methods chiefly used for the extraction of lead and tin from their ores are respectively:

[IIT-2004]

(1) self reduction and carbon reduction

(2) self reduction and electrolytic reduction

(3) carbon reduction and self reduction

(4) cyanide process and carbon reduction

10. Which ore contains both iron and copper ?

[IIT-2004]

(1) Cuprite (2) Chalcocite

(3) Chalcopyrite (4) Malachite

11. Extraction for zinc from zinc blende is achieved by:

[IIT-2007]

(1) electrolytic reduction

(2) roasting followed by reduction with carbon

(3) roasting followed by reduction with another metal

(4) roasting followed by self-reduction

12. Native silver metal forms a water soluble complex with a dilute aqueous solution of NaCN in the presence of

[IIT-2008]

(1) nitrogen

(2) oxygen

(3) carbon dioxide

(4) argon

Paragraph for questions 13 and 14

Copper is the most nobel of the first row transition metals and occurs in small deposits in several countries. Ores of copper include chalcanthite ($CuSO_4 . 5H_2O$), atacamite ($Cu_2Cl(OH)_3$), cuprite (Cu_2O), copper glance (Cu_2S) and malachite ($Cu_2(OH)_2CO_3$). However, 80% of the world copper production comes from the ore chalcopyrite ($CuFeS_2$). The extraction of copper from chalcopyrite involves partial roasting, removal of iron and self-reduction. **[IIT-2010]**

13. Iron is removed from chalcopyrite as :-

(1) FeO (2) FeS

(3) Fe_2O_3 (4) $FeSiO_3$

14. In self-reduction, the reducing species is :-

(1) S (2) O^{2-}

(3) S^{2-} (4) SO_2

15. Oxidation states of the metal in the minerals haematite and magnetite, respectively, are **[JEE-2011]**

(1) II, III in haematite and III in magnetite

(2) II, III in haematite and II in magnetite

(3) II in haematite and II, III in magnetite

(4) III in haematite and II, III in magnetite

16. Which method of purification is represented by the following equation : **[AIEEE-2012]**

$$Ti(s) + 2I_2(g) \xrightarrow{523K} TiI_4(g) \xrightarrow{1700K} Ti(s) + 2I_2(g)$$

(1) Van Arkel (2) Zone refining

(3) Cupellation (4) Poling

17. In the cyanide extraction process of silver from argentite ore, the oxidizing and reducing agents used are : **[JEE-2012]**

(1) O_2 and CO respectively.

(2) O_2 and Zn dust respectively.

(3) HNO_3 and Zn dust respectively.

(4) HNO_3 and CO respectively.

18. Sulfide ores are common for the metals - **[JEE-2013]**

(1) Ag, Cu and Pb (2) Ag, Cu and Sn

(3) Ag, Mg and Pb (4) Al, Cu and Pb

19. The carbon-based reduction method is **NOT** used for the extraction of **[JEE-2013]**

(1) tin from SnO_2

(2) Iron from Fe_2O_3

(3) aluminium from Al_2O_3

(4) magnesium from $MgCO_3.CaCO_3$

PREVIOUS YEARS QUESTIONS				ANSWER KEY						Exercise-II
Que.	1	2	3	4	5	6	7	8	9	10
Ans.	**3**	**3**	**2**	**3**	**1**	**1**	**1**	**1**	**1**	**3**
Que.	11	12	13	14	15	16	17	18	19	
Ans.	**2**	**2**	**4**	**3**	**4**	**1**	**2**	**1**	**3,4**	