

QB365

Important Questions - General Principles and Processes of Isolation of Elements

12th Standard CBSE

Chemistry

Reg.No. :

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Time : 01:00:00 Hrs

Total Marks : 50

**Section - A**

- 1) Smelting involves reduction of metal oxide with 1  
(a) carbon (b) carbon dioxide (c) magnesium (d) aluminium
- 2) In the extraction of aluminium by Hall-Heroult process, purified  $\text{Al}_2\text{O}_3$  is mixed with  $\text{CaF}_2$  to 1  
(a) lower the melting point of  $\text{Al}_2\text{O}_3$  (b) increase the conductivity of molten mixture  
(c) reduce  $\text{Al}^{3+}$  into  $\text{Al}(s)$  (d) (d) acts as catalyst
- 3) In which of the following method of purification, metal is converted to its volatile compound which is 1  
decomposed to give pure metal?  
(a) heating with stream of carbon monoxide (b) heating with iodine (c) liquation (d) distillation
- 4) Sodium cyanide is sometimes added in the froth floatation process as a depressant when the ore contains a 1  
mixture of  $\text{ZnS} + \text{PbS}$  because  
(a)  $\text{Pb}(\text{CN})_2$  gets precipitated without any effect on  $\text{ZnS}$   
(b)  $\text{ZnS}$  forms soluble complex,  $\text{Na}_2[\text{Zn}(\text{CN})_4]$  while  $\text{PbS}$  forms the froth  
(c)  $\text{PbS}$  forms soluble complex,  $\text{Na}_2[\text{Pb}(\text{CN})_4]$  while  $\text{ZnS}$  forms froth  
(d)  $\text{Zn}(\text{CN})_2$  gets precipitated without any effect on  $\text{PbS}$
- 5) Which of the following reaction is an example of calcination process? 1  
(a)  $2\text{Ag} + 2\text{HCl} + [\text{O}] \longrightarrow 2\text{AgCl} + \text{H}_2\text{O}$  (b)  $2\text{Zn} + \text{O}_2 \longrightarrow 2\text{ZnO}$  (c)  $2\text{ZnS} + 3\text{O}_2 \longrightarrow 2\text{ZnO} + 2\text{SO}_2$   
(d)  $\text{MgCO}_3 \longrightarrow \text{MgO} + \text{CO}$
- 6) Heating mixture of  $\text{Cu}_2\text{O}$  and  $\text{CuS}$  will give 1  
(a)  $\text{Cu} + \text{SO}_2$  (b)  $\text{Cu} + \text{SO}_3$  (c)  $\text{CuO} + \text{CuS}$  (d)  $\text{Cu}_2\text{SO}_3$
- 7) In the context of the Hall-Heroult process for the extraction of  $\text{Al}$ , which of the following statements is *false*? 1  
(a)  $\text{Al}^{3+}$  is reduced at the cathode to form  $\text{Al}$  (b)  $\text{Na}_3\text{AlF}_6$  serves as the electrolyte  
(c)  $\text{CO}$  and  $\text{CO}_2$  are produced in this process  
(d)  $\text{Al}_2\text{O}_3$  is mixed with  $\text{CaF}_2$  which lowers the melting point of the mixture and brings conductivity
- 8) During electrolytic refining of copper, some metals present as impurity settle as 'anode mud'. These are 1  
(a)  $\text{Sn}$  and  $\text{Ag}$  (b)  $\text{Pb}$  and  $\text{Zn}$  (c)  $\text{Zr}$  and  $\text{Ti}$  (d)  $\text{Fe}$  and  $\text{Ni}$
- 9) The earthy and silicon impurities which generally occur with ores is called ..... or ..... 1
- 10) Above  $1073\text{K}$ , ..... reduces  $\text{FeO}$  to  $\text{Fe}$  while below  $1073\text{K}$ , ..... reduces  $\text{FeO}_3$  to  $\text{Fe}$ . 1

**Section - B**

- 11) Copper can be extracted by hydrometallurgy but not zinc. Explain. 2
- 12) Why is zinc not extracted from zinc oxide through reduction using CO? 2
- 13) Which of the ores mentioned in Table 6.1, page 6/2 can be concentrated by magnetic separation method? 2
- 14) How do we separate two sulphide ores by froth floatation method? Explain with an example. 2
- 15) What should be the considerations during the extraction of metal by electrochemical method? 2

### Section - C

- 16) State the role of (i) depressant in froth floatation process. (ii) silica in the metallurgy of copper. (iii) graphite rod in the electrolytic reduction of alumina. 3
- 17) What chemical principle is involved in choosing a reducing agent for getting the metal from its oxide ore? Consider the metal oxides,  $Al_2O_3$  and  $Fe_2O_3$ , and justify the choice of reducing agent in each case. 3
- 18) The reaction:  $Cr_2O_3 + 2Al \rightarrow Al_2O_3 + 2Cr$ ;  $\Delta G^\circ = -421 \text{ kJ}$  is thermodynamically feasible as is apparent from Gibbs energy value. Why does it not take place at room temperature? 3
- 19) Describe the role of the following: (i)  $SiO_2$  in the extraction of copper from copper matte (ii) NaCN in froth floatation process 3
- 20) What are depressants? How would you separate Zinc sulphide (ZnS) and lead sulphide (PbS) ores? 3

### Section - D

- 21) While washing a miner's overalls, a washer woman noticed that sand and similar dirt fell to the bottom of the wash tub. What was peculiar, the copper bearing compounds that had come to the clothes from the mines were caught in the soapsuds and so they came to the top. One of her clients was a chemist, Mrs. Malik. The washer woman told her experience to Mrs. Malik. The latter thought that the idea could be used for separating copper compounds from rocky and earth materials on a large scale. After reading the above passage answer the following questions- 5
- (i) Name the process of concentration of ore based on the observation of washer woman.
- (ii) What type of ores are concentrated by this process?
- (iii) What values are shown by washer woman and Mrs. Malik?
- 22) In roasting, the ore is heated in a regular supply of air in furnace at a temperature below the melting point of the metal. Metal sulphide gets converted into metal oxide and sulphur dioxide gas is formed which is air pollutant. It also leads to the formation of acid rain which is harmful for crops and buildings made from marble. 5
- (i) Where should we have industries using roasting process in metallurgy? Give reason.
- (ii) How can sulphuric acid help in national economy?
- 23) Metals are very useful in our daily life. Aluminium powder is used in white paints. It is also used as a reducing agent. Alloys containing aluminium being light, are very useful. Utensils of aluminium are more popular than utensils of brass. Metals like silver, gold, iron, copper, zinc are very useful in our daily life. 5

Why are aluminium vessels preferred over copper and bronze vessels?

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