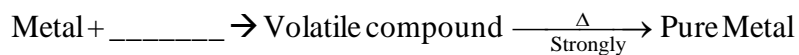


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### M.C.Q.

- 1) The most abundant metal in the earth's crust  
a) Al    b) Fe    c) Ca    d) Na
- 2) The impurities associated are  
a) Flux    b) Gangue    c) Slag    d) Ore
- 3) An ore after concentration was found to have basic impurities. The flux which can be used is  
a)  $\text{CaCO}_3$     b)  $\text{SiO}_2$     c) FeO    d)  $\text{Ca(OH)}_2$
- 4) Choose the correct statement  
a) All ores are minerals    b) All minerals are ores  
c) Minerals are not ores    d) a & b
- 5) A metal oxide is reduced with a metal,  $M_1$  of pd 3 & Gp 13. The process is known as \_\_\_\_\_ & the metal is  
a) Pyrometallurgy & Mg    b) Thermite & Ga    c) Liquefaction & Al    d) Thermite & Al
- 6) Diaspore & Corundum are ores of \_\_\_\_\_ & \_\_\_\_\_  
a) Al & Fe    b) Fe & Al    c) Al & Al    d) Si & Al
- 7) Choose the correct option  
a) Siderite  $\rightarrow \text{FeCO}_3$     b) Limonite  $\rightarrow \text{Fe}_2\text{O}_3$     c) Calamine  $\rightarrow \text{ZnCO}_3$     d) a & c
- 8) The salt which is most unlikely to occur as a mineral is  
a) Bromide    b) Sulphate    c) Oxide    d) Sulphides
- 9) During concentration of ore by froth flotation, the ore particles float on the surface because:  
a) Ores are insoluble    b) Sulphide ores are lighter  
c) The surface is not wetted by  $\text{H}_2\text{O}$     d) Difference in densities
- 10) An ore contains PbS with impurity ZnS. NaCN is added in the froth flotation process. ZnS does not form the froth because  
a) NaCN forms a complex of ZnS on the surface of ZnS    b) ZnS is not wetted by pine oil  
c) ZnS is wetted by  $\text{H}_2\text{O}$     d) NaCN reacts with ZnS ionic compound
- 11) The method used for concentration of magnetic ores is  
a) Gravity separation    b) Froth flotation    c) Magnetic separation    d) Leaching
- 12) During froth flotation process the student observed that the froth disappeared after formation. The student added----- \_\_\_\_\_ to the container to overcome the difficulty  
a) Pine oil    b) Cresol    c) Benzene    d) NaCN
- 13) Silver ore is related with  $\text{NaCN}_{(aq)}$  to  
a) Reduce silver    b) Extract pure silver  
c) Refine silver    d) To remove the impurities

- 
- 14) The principle involved in leaching is
- a) Difference in volatility  
b) Difference in density  
c) Difference in solubility  
d) Soluble complex formation
- 15) Heating of ore in presence of  $O_2$  below its melting point is known as
- a) Roasting  
b) Calcination  
c) Smelting  
d) b & c
- 16) During electrolysis graphite is used as an electrode & not diamond because
- a) Graphite is cheaper  
b) Graphite is soft  
c) Graphite possesses free electron while diamond doesn't  
d) Graphite is non reactive
- 17) Group 1 & 2 elements are extracted by
- a) Thermite process  
b) Electrolytic method  
c) Bessemerisation  
d) Cupellation
- 18) Hydrometallurgy is used in extraction of
- a) Sodium  
b) Manganese  
c) Iron  
d) Silver
- 19) Several metals are commercially produced by reduction of oxides by carbon. The oxides which can be reduced with carbon are
- a)  $ZnO$  &  $Fe_2O_3$   
b)  $CaO$  &  $Cr_2O_3$   
c)  $BaO$  &  $U_3O_8$   
d)  $SiO_2$  &  $Al_2O_3$
- 20) Blister copper is
- a) Pure copper  
b) Ore of Cu  
c) Alloy of Cu  
d) Impure copper
- 21) In Hall Heroult's process cryolite is added to alumina to
- a) Increase the conductivity  
b) Lower the melting point  
c) Increase the mobility of iron  
d) All of above
- 22) During extraction of metal charcoal powder is sprinkled on top of molten metal. This is useful in preventing
- a) Oxidation of metal  
b) Formation of alloy  
c) Reduction  
d) a & b
- 23) zone refining is used to obtain \_\_\_\_\_ metal
- a) Pure Cu  
b) Zirconium  
c) Ultrapure Si  
d) Nickel
- 24) Strongly



This method is known as

- a) Liquation  
b) Van Arkel  
c) Zone refining  
d) Distillation
- 25) \_\_\_\_\_ metal is purified by Mond's process
- a) Zr  
b) Ti  
c) Ge  
d) Ni
- 26) The slag obtained during manufacture of Cu is
- a)  $CaSiO_3$   
b)  $FeSiO_3$   
c)  $CuSiO_3$   
d) FeO

- 27) The principle used in zone refining  
 a) Fractional distillation  
 b) Adsorption  
 c) Fractional crystallisation  
 d) Chromatographic separation
- 28) In the reaction  $2MO_{(s)} + C_{(s)} \rightarrow M_{(s)} + CO_{2(g)}$  the entropy of the reaction will  
 a) Decreases  
 b) Increases  
 c) Remain constant  
 d) May increase or decrease
- 29) In electrolytic refining of copper, anode mud contains  
 a) Earthly impurities  
 b) Zn & Mn  
 c) Noble metal  
 d) Oxides of Cu
- 30) Zn is extracted from ZnS. The reducing agent used is \_\_\_\_\_ & method of refining is \_\_\_\_\_  
 a) Coke & Electrolysis  
 b) Mg & Liqation  
 c) Coke & Zone refining  
 d) Coke & fractional distillation

**(31 To 40 are match the following sets.)**

- 31) Set 1  
 1) Al  
 2) Fe  
 3) Zn  
 4) Ag
- Set 2  
 p) Haematite  
 q) Nuggets  
 r) Sphalerite  
 s) Feldspar  
 t) Limonite
- a) 1-p, 2-t, 3-r, 4-q  
 b) 1-s, 2-p & t, 3-r, 4-q  
 c) 1-s, 2-r & t, 3-p, 4-q  
 d) 1-p, 2-t, 3-r, 4-s
- 32) Set 1  
 1) Pig iron  
 2) Cast iron  
 3) Wrought iron
- Set 2  
 p) Hard & brittle  
 q) Prepared from cast Fe  
 r) Prepared by methyl pig iron  
 s) Malleable  
 t) Fe + 4% C
- a) 1-t, 2-p & r, 3-q & s  
 b) 1-t, 2-r, 3-s  
 c) 1-p, 2-r & t, 3-q & s  
 d) 1-p, 2-s & r, 3-t & q
- 33) Set 1  
 1)  $Cr_2O_3 + Al$   
 2) Zinc  
 3)  $M_2O_3 + NaOH \rightarrow$   
 Soluble  $\xrightarrow{\Delta} M_2O_3$
- Set 2  
 p) electrolysis  
 q) Bayer's process  
 r) Thermite  
 s) Hall Heroult
- a) 1-r, 2-p, 3-s  
 b) 1-r, 2-s, 3-p  
 c) 1-s, 2-p, 3-q  
 d) 1-r, 2-p, 3-q

- 34) Set 1  
 1) Chromatography  
 2) Poling  
 3) Liquation  
 4) Zonerefining
- Set 2  
 p) Chemical process  
 q) Difference in solubility  
 r) Difference in melting point  
 s) Low boiling point metal  
 t) Adsorption
- a) 1-r, 2-p, 3-s, 4-q      b) 1-q, 2-r, 3-p, 4-s      c) 1-t, 2-p, 3-s, 4-q      d) 1-p, 2-p, 3-s, 4-q
- 35) Set 1  
 1) Earthly impurities  
 2) Sulphide ores  
 3) Bauxite  
 4) Magnetite
- Set 2  
 p) Froth flotation  
 q) Magnetic separation  
 r) Gravity separation  
 s) Leaching
- a) 1-p, 2-r, 3-s, 4-q      b) 1-r, 2-p, 3-s, 4-q      c) 1-q, 2-r, 3-p, 4-s      d) 1-s, 2-p, 3-r, 4-q
- 36) Given below are the different temperature reactions & products during extraction of iron in blast furnace
- 1)  $500^{\circ}$ - $800^{\circ}$  K      p) Pig iron  
 2)  $1270^{\circ}$       q) Molten slag  
 3)  $2170^{\circ}$       r)  $C + O_2 \rightarrow 2CO$   
 4)  $2170$       s)  $3Fe_2O_3 + CO \rightarrow 2Fe_3O_4 + CO_2$   
 5)  $> 2170^{\circ}$       t)  $CaO + SiO_2 \rightarrow CaSiO_3$
- a) 1-s, 2-q, 3-r, 4-p      b) 1-s, t ; 2-r, 3-q, 4-p  
 c) 1-r, s ; 2-t, 3-p, 4-q      d) 1-s, 2-r, 3-q, 4-p
- 37) Set 1  
 1) Bauxite  
 2) Zincblend  
 3) Copper pyrites  
 4) Haematite
- Set 2  
 p) Bayers  
 q) Blast Furnace  
 r) Hall-heroult  
 s) Bessemerisation  
 t) Fire Clay cylindrical retort
- a) 1-r & p, 2-t, 3-s, 4-q      b) 1-p, 2-t, 3-s, 4-q      c) 1-r, 2-s, 3-s, 4-q      d) 1-r, 2-t, 3-s, 4-q
- 38) Set 1  
 1) Zn  
 2) Wrought iron  
 3) Steel  
 4) Copper
- Set 2  
 p) Automobiles  
 q) Galvanising  
 r) Bell Metal  
 s) Muntz Metal  
 t) Anchors
- a) 1-s, 2-r, 3-t, 4-q      b) 1-q & r, 2-t, 3-p, 4-r & s  
 c) 1-q, 2-s, 3-p, 4-r      d) 1-q, 2-t, 3-p, 4-r & s



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- 47) Statement 1) Ultrapure silicon is manufactured by vapour phase refining  
Statement 2) Vapour phase refining gives ultrapure metals
- 48) Statement 1) Ni is converted to Ni(CO)<sub>4</sub> in Mond process  
Statement 2) Ni(CO)<sub>4</sub> is volatile & the compound can be easily disposable
- 49) Statement 1) Mercury is purified by distillation  
Statement 2) Mercury has low melting point

**True / false questions (50-58)**

50)

- 1) Ag & Au are manufactured by hydrometallurgy  
2) Fe can be extracted by electrolytic method  
3) Mg is extracted from aq MgCl<sub>2</sub> by passing electric current  
4) Zn is extracted from Zinc blend by using coal or anthracite coal
- a) TFFT                      b) TFFT                      c) FFFT                      d) FFTT

51) The metals which can be extracted using carbon/coke

- 1) Magnesium  
2) Iron  
3) Potassium  
4) Zinc
- a) FTTF                      b) TTFF                      c) TTFT                      d) FTFT

52)

- 1)  $\Delta G^0 = -nFE^0$   
2) The above equation is the principle used in electrolytic reduction for manufacture of metals  
3)  $2\text{Cu}_2\text{S}_{(s)} + 3\text{O}_{2(g)} \xrightarrow{\Delta} 2\text{Cu}_2\text{O}_{(s)} + 2\text{SO}_{2(g)}$   $\Delta S$  is positive in this reaction  
4)  $\Delta G = \Delta H - T\Delta S$  if free energy change is negative the reaction is spontaneous
- a) TFFT                      b) TTFT                      c) TTTT                      d) TFTF

53)

- 1) Kaolinite is an ore of Al  
2) Sphalerite is an ore of sulphide of Cu  
3) Malachite is an oxide ore of copper  
4) sphalerite is iron carbonate
- a) TFFT                      b) TTFT                      c) TFFT                      d) TFFF

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54)

- 1) Ore is heated strongly during calcinations to remove all volatile impurities
  - 2) Ore is heated with oxygen during roasting to convert sulphide to oxide
  - 3) Cryolite is added to bauxite in Hall Heroult's process to increase solubility of bauxite in \_\_\_\_\_
  - 4) After leaching of bauxite, it is directly used as an electrolyte
- a) TTFF                      b) TTFT                      c) TTTF                      d) TFFT

55)

1. The reduction reaction by accepting electrons is known as electro nation
  2. In extraction of Gold and silver by process of leaching  $K > 1$
  3. If  $\Delta H = -1369 \text{ KJ/mol}^{-1}$ ,  $\Delta S = +26 \text{ J/mol}^{-1}$   $T = 400\text{K}$  for the reaction  $A + B \rightarrow C$  the reaction is non spontaneous
- a) TTT                      b) TTF                      c) TFT                      d) TFF

56)

1. Chewing of cathode occurs in Hall Heroult's process
  2. When water is added after digesting boxide,  $\text{CO}_2$  is bobbled to nutrelise the solution
  3.  $\text{HCl}$  cannot be replaced in (2) because  $\text{AlCl}_3$  is formed which is highly soluble
- a) FTF                      b) TTF                      c) FFF                      d) FTT

57)

1. Alis used in preparation of parts of airplane and manufacture of alloy alnico.
  2. Copper is used in preparation of tubes of boilers, delta metal and muntz metal.
  3. Copper and aluminum are used in alloys – Duralumin, Aluminum bronze.
  4.  $\text{Cu}$  &  $\text{Zn}$  are used in manufacture of German Silver.
- a) TTF                      b) TTFT                      c) TFFT                      d) TFFT

58)

1. Wet metallurgical process is used for pyrites ores of lower grade.
  2.  $2\text{Cl}^- + 2\text{H}_2\text{O} \rightarrow 2\text{OH}^- + \text{H}_2 + \text{Cl}_2$  The cell potential is  $-2.186\text{V}$ . This reaction will take place in forward direction.
  3. Pure  $\text{Zn}$  metal is called spliter.
  4. The abundance of  $\text{Al}$  is highest. Its place is third & is about 8.3% by weight.
- a) TFFT                      b) TTTT                      c) FTFT                      d) FFFT





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## ANSWER KEY

1	A	16	C	31	B	46	C
2	B	17	B	32	A	47	D
3	B	18	D	33	D	48	A
4	A	19	A	34	C	49	A
5	D	20	D	35	B	50	A
6	C	21	B	36	D	51	D
7	D	22	A	37	A	52	B
8	B	23	C	38	D	53	C
9	C	24	B	39	B	54	A
10	A	25	D	40	B	55	B
11	C	26	B	41	A	56	D
12	b	27	C	42	D	57	B
13	D	28	B	43	D	58	A
14	D	29	C	44	C	59	D
15	A	30	D	45	A	60	A