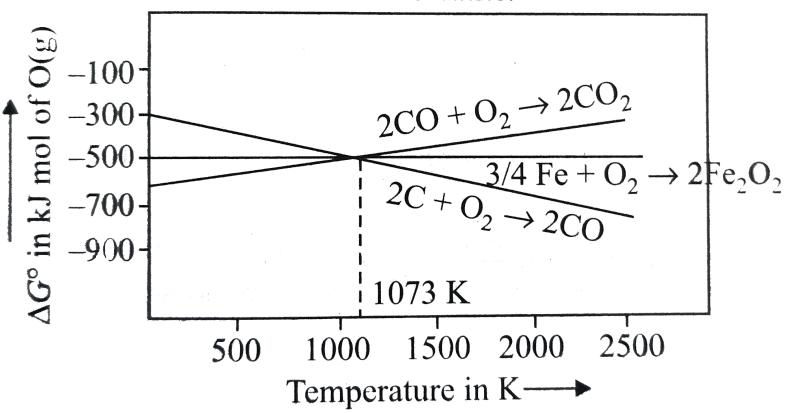
CHEMISTRY

BOOKS - A2Z CHEMISTRY (HINGLISH)

GENERAL PRINCIPLES AND PROCESS OF ISOLATION OF METALS

Section A Topicwise Questions

1. Which of the following is correct regarding following diagram or reduction of haematite.



Temperature in $K \rightarrow$ Ellingham diagram fro the reduction of haematite

A. Below $1073K$, C is batter reducing agent

B. Below $1073K$, CO is batter reducing agent

C. Above $1073K$, C is batery reducing agent

D. Haematite can't be reduced by C or CO.

Answer: B

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2. Which of the following represents the thermite reaction ?

A. $3Mn_3O_4 + 8A1 \rightarrow 9Mn + 4A1_2O_3$

B. $MgCO_3 + SiO_2 \rightarrow MgSiO_3 + CO_2$

C. $Cu_2S + 2Cu_2O \rightarrow 6Cu + S)_2$

D. $Fe_2O_3 + 3CO \rightarrow 2Fe + 3CO_2$

Answer: A

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3. In Ellingham diagram, the slope of the curve of the formation metal oxide:

A. is mostly $+ve$

B. is mostly $-ve$

C. depends on the type of metal

D. depends on the formula of metal oxide

Answer: A

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4. Carbon cannot be used in the reduction of $A1_2O_3$ because:

A. it is non-metal

B. the heat of formation of CO_2 is more than that $A1_2O_3$

C. pure carbon is not easily available

D. the heat of formation of $A1_2O_3$ is too high

Answer: D

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5. when compared to ΔG° for the formation of $A1_2O_3$ the Δg° for the formation of Cr_2O_3 is

A. Same

B. Lower

C. Higher

D. Unpredicated

Answer: C

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6. A sulphide ore like ZnS is first roasted into its oxide prior to reduction by carbon because:

A. a sulphide ore cannot be reduced be reduced to metal at all

B. no reducing agent is found suitable for reducing a sulphide ore.

C. the Gibbs free enegry of formation of most sulphides are greater than half fro CS_2.

D. a metal oxide is genarally less stable than the metal sulphide.

Answer: C

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7. A sulphide ore like ZnS is first roasted into its oxide prior to reduction by carbon because:

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Answer: C

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8. According to Ellingham diagram the oxidation reaction of carbon and carbon monoxide may be used to reduce which one

of the following oxides at the lowest temperature?

A. $A1_2O_3$

B. Cu_2O

C. MgO

D. ZnO

Answer: B

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9. Which metal has a greater tendency to from metal oxide?

A. Cr

B. Ca

C. $A1$

D. Fe`

Answer: B

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10. Select correct statement

A. In the decomposition of an oxide into oxyhen and solid//liquid metal, entropy increases.

B. Decomposition of an oxide is an endothermic change.

C. To make ΔG° negative, temperature should be high enough so that $T\Delta S^\circ > \Delta H^\circ$.

D. All statements are correct.

Answer: D

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11. Ellingham diargram respresents a graph of

A. $\Delta GvsT$

B. $\Delta S^{\circ}vcT$

C. $\Delta G^{\circ}vsT$

D. $\Delta GvsP$

Answer: C

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12. Formation of metallic copper from sulphide ore in te normal thermometallurgical process essentially involves which of the following reactions

A. $CuS + \frac{3}{2}O_2 \rightarrow CuO + SO_2$,

$CuO + C \rightarrow Cu + CO$

B. $CuS + \frac{3}{2}O_2 \rightarrow 3Cu + SO_2$,

$2CuO + CuS \rightarrow 3CuO + SO_2$

C. $CuS + 2O_2 \rightarrow CuSO_4$,

D. $CuS + \frac{3}{2}O_2 \rightarrow CuO + SO_2$

Answer: B

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13. The minimum voltage required to electrolyse alumina in the Hall-Heroul process is [Given, $\Delta G^\circ\_(f)(A1_2O_3) = -1520kJ/mol$ and $\Delta G^\circ\_(f)(CO_2) = 394kJ/mol$]

A. $1.60V$

B. $1.575V$

C. $1.312V$

D. $-2.62V$

Answer: A

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14. The main reaction occuring in blast furnace during the extraction of iron form haematite is

A. $Fe_2O_3 + 3C \rightarrow 2Fe + 3CO$

B. $FeO + SiO_2 \rightarrow FeSiO_3$

C. $Fe_2O_3 + 3CO \rightarrow 2Fe_3O_4 + CO_2$

D. $CaO + SiO_2 \rightarrow CaSiO_3$

Answer: C

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15. Which of the following statements is true?

A. Raduction of a metal oxide is easier if the metal formed is in liquid state at reduction temperature

B. Reduction of metal oxide is normally less feasible at high temperature

C. The oxidation of CO into CO_2 will have a negative slope on Ellingham diagram

D. The reactive metals have positive slope for oxidation on Ellingham diagram whereas no-reactive metals have a negative slope

Answer: A

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16. Ellingham diagram respresents:

A. change of ΔG with temperature.

B. change of ΔH with temperature.

C. change of ΔG with pressure.

D. change of $(\Delta G - T\Delta S)$ with temperature.

Answer: A

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17. Based on given information $\Delta G^{\circ}\_(f)(CaO) = -604.2kJ/mol$ and $\Delta G^{\circ}\_(f)(A1_2O_3) = -1582kJ/mol$, which of the following is feasible?

A. $2Ca + A1_2O_3 \rightarrow 2A1 + 3CaO$

B. $3CaO + 2A1 \rightarrow A1_2O_3 + 3Ca$

C. Both (a) and (b)

D. None of the above

Answer: A

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18. Consider the following reaction at $1000^{\circ}C$

(A) $Zn(s) + \frac{1}{2}O_2(g) \rightarrow ZnO(s), \Delta G^{\Theta} = -360kJmol^{-1}$

(B) $C(s) + \frac{1}{2}O_2(g) \rightarrow OO(g), \Delta G^{\Theta} = -460kJmol^{-1}$

Choose the correct statement at $1000^{\circ}C$

A. Zinc can be oxidised by CO

B. ZnO can be reduced by C

C. ZnO can be reduced by CO

D. None of the above

Answer: B

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19. $\Delta G^{\circ} vs T$ plot in the Ellingham diagram slopes down for the reaction.

A. $C + \frac{1}{2}O_2 \rightarrow CO$

B. $2Ag + \frac{1}{2}O_2 \rightarrow AG_2O$

C. $Mg + \frac{1}{2}O_2 \rightarrow MgO$

D. $CO + \frac{1}{2}O_2 \rightarrow CO_2$

Answer: A

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20. Ore of which of the following element is a metalloid?

A. As

B. Na

C. Au

D. Fe

Answer: A

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21. The rocky and siliceous matter associated with an ore is called:

A. Slag

B. Mineral

C. Matrix or Gangue

D. Flux

Answer: C

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22. The most abundant alkaline earth metal (in earth's crust) is

A. Hydrogen

B. Oxygen

C. Silicon

D. Carbon

Answer: B

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23. Which of the following in not an ore?

A. Malachite

B. Calamine

C. Salt cake

D. Carussite

Answer: C

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24. The formula of carnallite is

A. Ca

B. Na

C. Mg

D. Zn

Answer: C

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25. Which of the following statements is correct?

A. Bauxite is an ore of aluminium

B. Magnetite is an ore of manganses

C. Haematite is an ore of mercury

D. Pyrites is an ore of phosphorus

Answer: A

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26. Electrolytic reduction method is used for the extraction of :

A. Highly electronegative elements

B. Highly electropositive elements

C. Transition metals

D. Metalloids

Answer: B

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27. Which of the following metal is not found in free state?

A. Na

B. Au

C. Ag

D. Pb

Answer: A

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28. Metal which can be extracted from all three dolomite, magnesite and caranallite is

A. Na

B. K

C. Mg

D. Ca

Answer: C

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29. Which is not correct statements?

A. Cassiterite, chromite and haematite are concentrated by hydraulic washing (Tabling).

B. Pure $A1_2O_3$ is obtained form the bauxite ore by leaching in the Bayer's process.

C. Sulphide ore is concentrated by calcination method.

D. Roasting can convert sulphide into oxide or sulphate and part of sulphide and part of sulphide may also act as a reducing agent.

Answer: C

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30. Which of the following minerals is not an ore of aluminum?

A. Bauxite

B. Gypsum

C. Cryolite

D. Corundum

Answer: B

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31. The process of removing lighter gangue particles by washing in a current if water is called:

A. levigation

B. liquation

C. leaching

D. cupellation

Answer: A

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32. Cryolite is

A. Magnesium silicate

B. Sodium borofluroide

C. Sodium aluminium fluroide

D. Magnesium silicate

Answer: C

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33. An example of halide ore is :

A. Galena

B. Bauxite

C. Cinnabar

D. Cryolite

Answer: D

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34. Which mineral has been nemed incorrectly?

A. $Bau\xi te$: A1_(2)O_(3).2H_(2)O`

B. Corundum: $A1_2O_3$

C. cryolite: $3NaF.\ AIF_3$

D. Feldspar: $Be_3A1_2Si_6O_{18}$

Answer: D

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35. An important oxide ore if iron is

A. Haemitite

B. Siderite

C. Pyrites

D. Malachite

Answer: A

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36. Which is (are) not an ore ?

A. Bauxite

B. Malachite

C. Zince blende

D. Pig iron

Answer: D

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37. Cyanide proces is used for the extraction of

A. Au

B. Cu

C. Zn

D. Fe

Answer: A

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38. Which of the following is ferrous alloy?

A. Invar

B. Solder

C. Magnalium

D. Type metal

Answer: A

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39. Which is not a mineral of aluminium?

A. Anhydrite

B. Bauxite

C. Corundum

D. Diaspore

Answer: A

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40. $NaCN$ is sometimes added in the frouth flotation process as a depresant when ZnS and PbS minerals are expected because:

A. $Pb(CN)_2$ is percipitated while no effect on ZnS

B. ZnS froms soluble complex $Na_2\left[Zn(CN)_4\right]$ while PbS forms froth

C. PbS forms soluble complex $Na_2\left[Pb(CN)_4\right]$ while ZNS forms froth

D. $NaCN$ is never added in froth floatation preocess

Answer: B

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41. Azurite is an ore of

A. Ag

B. Cu

C. Pt

D. Au

Answer: B

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42. Which of the following ore does not represent the ore of iron?

A. Haemitite

B. Magnetite

C. Cassiterite

D. Limonite

Answer: C

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43. Gravity separation method is based upon:

A. perferential washing of ores and gangue particles.

B. difference in densities of ore particles and impurities.

C. difference in chemical properaties of ore particles and impurities.

D. none of these

Answer: B

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44. Copper can be extracted from

A. Kupfernickel

B. Dolomite

C. Galena

D. Malachite

Answer: D

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45. Argentite is a mineral of

A. Copper

B. Silver

C. Platinum

D. Gold

Answer: B

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46. The formula of carnallite is

A. $LiA1(Si_2O_5)_2$

B. $KCI.\ MGC1_2.6H_2O$

C. $K_2O.\ A1_2O_3.6SiO_2$

D. $KCI.\ MgC1_2.2H_2O$

Answer: B

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47. Which of the following statements is incorrect?

A. Silver glance mainly contains silver sulphide

B. Gold is found in native state

C. Zinc blende mainly contains zince chloride

D. Copper pyrites also contain Fe_2S_3

Answer: C

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48. Which of the following is not an ore of lead?

A. Galena

B. Anglesite

C. Calamine

D. Cerussite

Answer: C

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49. Which of the following is not a refining process?

A. Dressing

B. van Arkel process

C. Cementation

D. Poling

Answer: C

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50. Among the following statements, the incorrect one is

A. Calamine and siderite are carbonates

B. Argentite and cuprite are oxides

C. Zinc blende and pyrites are sulphides

D. Malachite and azurite are ores of copper

Answer: B

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51. Which one of the following is correct?

A. A mineral cannot be an ore

B. An ore cannot be a mineral

C. All minerals are ores

D. All ores are minerals

Answer: D

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52. Dolomite is mineral whose formula is

A. $CaMg(CO_3)_2$

B. $MgCO_3$

C. $CaCO_3 . MgCO_3$

D. Both (a) and (c)

Answer: D

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53. Which one of the following ores is a chloride?

A. Horn silver

B. Zincite

C. Bauxite

D. Feldspar

Answer: A

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54. Which ore contains both iron and copper?

A. Cuprite

B. Chalcocite

C. Chalcopyrite

D. Malachite

Answer: C

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55. Corundum is an ore of aluminium.

A. Copper

B. Boron

C. Aluminium

D. Sodium

Answer: C

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56. (h) In froth process, the ore particles float because their surface is ___.

A. they are light.

B. they are insoluble

C. their surface is perferentially wetted by oil.

D. they bear an electrostatic charge.

Answer: C

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57. Which of the following is not an ore of magnesium?

A. Magnesite

B. Dolomite

C. Gypsum

D. Carnallite

Answer: C

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58. Magnetic separation process may be used fro the concentration of :

A. chalcopyrite

B. bauxite

C. haematite

D. calamine

Answer: C

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59. Magnetic separation is used for increasing concentration of the following

A. Horn silver

B. Calcite

C. Haematite

D. Magnesite

Answer: C

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60. Which of the following is not a mineral of iron?

A. Magnetite

B. Siderite

C. Smithsonite

D. Limonite

Answer: C

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61. In electrorefining, the impure metal is made _____.

A. Cathode

B. Anode

C. Electrolyte

D. Both (a) and (c)

Answer: B

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62. For which ore of the metal, froth floatation method used for concentration

A. Horn silver

B. Bauxite

C. Cinnabar

D. Haematite

Answer: C

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63. Bauxite is leached with:

A. $KC1$

B. $NaCN$

C. $NaOH$

D. Na_2SO_4

Answer: C

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64. The substance added in water in the froth floatation process is

A. Soap powder

B. Pine oil

C. Coconut oil

D. None of these

Answer: B

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65. Process of heating ore is air to remove sulphur is:

A. calcination

B. roasting

C. smelting

D. none of these

Answer: B

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66. Which of the following substance can be used for drying neutral or basic gases?

A. $CaCO_3$

B. Na_2CO_3

C. $NaHCO_3$

D. CaO

Answer: D

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67. Refractory materials are generally used in furnaces because

A. They posses great structual strength

B. They can withstand high temperature

C. They are chemically inert

D. They do not require replacement

Answer: B

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68. Which one of the following is not a method of concentrain of ore?

A. electromagnetic separation

B. smelting

C. gravity separation

D. froth floatation process

Answer: B

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69. Flux is used to remove

A. Silica

B. Metal oxide

C. All impurities from ores

D. Silica and undersirable metal oxide

Answer: D

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70. Main function of roasting is :

A. To remove volatile sunstances

B. Oxidation

C. Reduction

D. Slag formation

Answer: A

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71. Which of the following matels cannot be extracted by carbon reducation process?

A. Pb

B. $A1$

C. Hg

D. Zn

Answer: B

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72. (h) In froth process, the ore particles float because their surface is ___.

A. they are light.

B. they are insoluble

C. they are charged

D. they are hydrophobic

Answer: D

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73. (iii) Which is not a basic flux ?

A. $CaCO_3$

B. Lime

C. SiO_2

D. CaO

Answer: C

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74. Roasting of ores is done in

A. moisture is removed

B. non-metals as their volatile oxide are removed

C. ore become porocus.

D. all the above.

Answer: D

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75. When limestone is heated strongly, it gives off CO_2. In matallurgy this process is known as

A. Calcination

B. Roasting

C. Smelting

D. Ore dressing

Answer: A

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76. Choose the correct option the code regarding roasting process.

(I) It is the process of heating the ore in air in a reverberatory furnace to obtain the oxide.

(II) It is an exothermic process.

(III) It is used for the concentration of sulphide ore.

(Iv) It removes easily oxidisable volatile impurities present in the concentrated ore.

A. I, II and III

B. I, II and IV

C. I, II and IV

D. I, II, III and IV

Answer: D

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77. The sunstance which is mixed with the ore for removel of impurities is termed

A. Slag

B. Gangue

C. Flux

D. Catalsyt

Answer: C

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78. Calcination is used in matallurgy for removal of

A. Water and sulphide

B. Water and CO_2

C. CO_2 and H_2S

D. H_2 and H_2S

Answer: B

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79. The process of the isolation of a metal by dissolving the ora in a suitable chemical regent followed by precipitaiton of the matal by a more electropositive metal is called:

A. hydrometallurgy

B. electrometallurgy

C. zone refining

D. electro-refining

Answer: A

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80. A metal obtained directly by roasting of its sulphide ore is

A. Cu

B. Pb

C. Hg

D. Zn

Answer: C

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81. Roasting is carried out in case of :

A. galena

B. iron pyrites

C. copper glance

D. all of these

Answer: D

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82. Which of the following in not an ore?

A. malachite

B. calamine

C. stellite

D. cerussite

Answer: C

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83. Which of the ore dressing process requires finest size fo ore?

A. froth folatation

B. gravity separation

C. magnetic separation

D. all of these

Answer: A

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84. Roasting is done in

A. Blast furnace

B. Open herath furnace

C. Electric furnace

D. None of these

Answer: A

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85. Which of the following does not contain Mg?

A. magnetic

B. magnesite

C. absestos

D. carnallite

Answer: A

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86. Slag is a product of:

A. flux and coke

B. coke and metal oxide

C. flux and impurities

D. metal and flux

Answer: C

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87. Heating of ore in presence of air to remove sulphure impurities is called

A. Calcination

B. Roasting

C. Smelting

D. None of these

Answer: B

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88. In zone-refining methode the molten zone

A. consists of impurities only

B. contains more impurity than the original metal

C. contains the purified metal only

D. moves to either side

Answer: B

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89. Which one of the following sulphide ores is concentrated by chemical leaching ?

A. Pyrite

B. Galena

C. Epsomite

D. argentite

Answer: D

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90. The important step in the extraction of metal from carbonate ore is

A. Calcination

B. Roasting

C. Electro-reduction

D. Cupellation

Answer: A

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91. Annealing of stell is the precess of heating steel

A. to a bright red hot and then cooling it slowely

B. to a bright red hot and then cooling it suddenly

C. to a temperature much below redness and cooling it slowly

D. none of these

Answer: A

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92. Carbon reduction process is used for the extraction of :

A. Hg

B. Zn

C. Cr

D. Fe

Answer: D

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93. An ore after levigation is found to have acidic impurities. When of the following can be used as flux during smelting operation ?

A. H_2SO_4

B. $CaCO_3$

C. SiO_2

D. Both (CaO) and (SiO_2)

Answer: C

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94. Chemical reduction is not suitable for convering

A. Bauxite into aluminium

B. Cuprite into copper

C. Haemaitite into iron

D. Zince oxide into zinc

Answer: A

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95. Sintering is the preocess, in which

A. roasting of ore takens place

B. calcination of ore takes place

C. reduction of ore takes place

D. melting of ore takes place

Answer: A

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96. Function of the flux added during smelting is

A. To make ore porous

B. To remove gangue

C. To make reduction easier

D. To precipitate slag

Answer: B

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97. Among the following statements, the incorrect one is

A. calamine and siderite are carbonates

B. argentite and cuprite are oxides

C. zinc blende and iron pyrites are sulphides

D. malachite and azurite are ores of copper

Answer: B

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98. Which of the following is not correct about refractories?

A. They should have high melting point

B. They should have low thermal conductivity

C. They should be inert

D. They should not react with flux

Answer: C

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99. Which technique is used in the manufacture of aluminium from bauxite?

A. Reduction with magnesium

B. Reduction with coke

C. Electrolytic reduction

D. Reduction with iron

Answer: C

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100. Electrolytic reduction method is used for the extraction of

A. highly electronegative elements.

B. highly electropositive elements.

C. transition metals.

D. nobel metals.

Answer: B

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101. Roasting or calcination is not an essential step to extract metal from this ore

A. Chalcocite

B. Galena

C. Argentite

D. Cerussite

Answer: C

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102. Which one of the following metals cannot be extracted by carbon reduction?

A. Pb

B. Fe

C. Zn

D. $A1.$

Answer: D

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103. After partial roasting, the sulphide of copper is reduced by

A. Reduction by carbon

B. Electrolysis

C. Self-reduction

D. Cyanide process

Answer: C

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104. Green coloured ore among the folowing is

A. Cu_2O

B. $CuFeS_2$

C. $CuCO_3.Cu(OH)_2$

D. $2CuCO_3.Cu(OH)_2$

Answer: C

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105. The process of the isolation of a metal by dissolving the ora in a suitable chemical regent followed by precipitaiton of the matal by a more electropositive metal is called:

A. electrometallugry

B. hydrometallurgy

C. electro-refining

D. zone refining.

Answer: B

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106. In the metallurgical extraction of zince from ZnO the reducting agent used is

A. Carbon monoxide

B. Sulphur dioxide

C. Carbon dioxide

D. Nitric oxide

Answer: A

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107. In order to refine "blister copper" it is metled in a furnace and is stirred with green logs of wood. The purpose is

A. To expel the dissolved gases in blister copper

B. To bring the impurities to surface and oxidize them

C. To increase the carbon content of copper

D. To reduce the metallic oxide impurities with hydrocarbon gases liberated from the wood

Answer: D

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108. An alloy which does not contain copper is

A. Solder

B. bronze

C. Brass

D. Bell metal

Answer: A

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109. van Arkel method of purification of metals involves converting the metal to:

A. volatile stable compound.

B. voltatile ustable compoound.

C. non-volatile stable compound

D. none of these.

Answer: B

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110. The metal extraced by electrolysis of its fused salt is

A. Iron

B. Lead

C. Sodium

D. Copper

Answer: C

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111. Which of the following is not the ore of aluminium?

A. Bauxite

B. Corundum

C. Langbeinite

D. Kaolinite

Answer: C

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112. To obtain chromium from chromic oxide (Cr_3O_3) the method used is

A. Alumino-thermic process

B. Electrolytic reduction

C. Carbon reduction

D. Carbon monoxide reduction

Answer: A

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113. Consider the following isolation//purification processes.

(I) Heating impure metal with I_2 at $150 - 200^\circ C$ and passing the resulting volatile iodide on hot tungsten filament at $1400^\circ C$ to get the pure metal.

(II) Heating the sulphide ore in air until a part is converted to oxide and then further heating in the absence of air to let the oxide react with unchanged metal sulphide to get the metal.

(III) Electroysis of the molten electrolyte containing metal oxide and cryolite of fluorspar to obtain the metal.

The processes used for obtaining aluminium, titanium and lead are respectively:

A. (I), (II) and (III)

B. (II), (III) and (I)

C. (III), $(I)$and (II)

D. (II), $(I)$and (III)

Answer: C

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114. The substance used in the thermite process of reducing metal ores is

A. Aluminium

B. Thorium

C. Heated platinum gauze

D. Carbon

Answer: A

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115. Heating with carbon in absence of air is known as

A. Reduction

B. Carbon-reduction

C. Smelting

D. Roasting

Answer: लाल P+Br_2NBH_3

$R - CH_2 - COOH \overset{P}{\rightarrow} A \overset{Br_2}{\longrightarrow}$ **एलेनीन**

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Metallurgy Of Cu Fe Ag Al Zn And Au

1. Self-reduction of Cu_2S to Cu can be carried out in.

A. Bessemer converter

B. blast furnace

C. both (a) and (b)

D. none of these

Answer: A

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2. Cyanide proces is used for the extraction of

A. Au

B. Ag

C. both (a) and (b)

D. Cu

Answer: C

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3. Cryolite is:

A. $Na_3A1F_6$and is used in the electroysis of alumina for decreasing electrial conductivity.

B. Na_3A1F_6 and is used in the electroysis of alumina for lowering the melting point of alumina.

C. $Na_3A1F_6$and is used in the electroytic purification of alumina.

D. $Na_3A1F_6$and is used in the electroysis of alumina for increasing the melting point and electrical conductivity.

Answer: B

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4. Bauxite ore is concentrated by

A. Froth flotation

B. Electromagntic separation

C. Chemical separation

D. Hydraulic separation

Answer: C

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5. Select correct matching

A. Pyrometallurgy: Extraction of Fe

B. Electrometallurgy: Extraction of $A1$

C. Hydrometallurgy: Extraction of Au

D. All of the above are correct

Answer: D

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6. In extraction of copper, we use

A. Cu_2S

B. Pyrites

C. Silver argentocyanide

D. $CuFeS_2$

Answer: D

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7. In the extraction of Cu the reaction takes place Bessemer converter is:

A. $2Cu_2O + Cu_2S \rightarrow 6Cu + SO_2.$

B. $2CuFeS_2 + O_2 \rightarrow Cu_2S + FeS + SO_2.$

C. $2Cu_2S + 3O_2 \rightarrow 2Cu_2O + 2SO_2.$

D. $2FeS + 3O_2 \rightarrow 2FeO + 2SO_2.$

Answer: A

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8. Copper pyrites are concentrated by

A. Electromagnetic method

B. Gravity method

C. Froth floatation process

D. All of the above methods

Answer: C

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9. An ore like zinc blends is concentrated by

A. Froth floatation

B. Magnetic separation

C. Leaching

D. Washing with water

Answer: A

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10. Which of the following statement is incorrect about the extractive metallurgy of coper?

A. Matte chiefly consists of iron sulphide and some ferrous oxide.

B. The impurity of iron sulphides is removed as fusible ferrous slag, $FeSiO_3$ during roasting.

C. The copper pyrite is concentrated by froth floatation process.

D. Copper is obtained by self-reduction in Bessemer converter.

Answer: A

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11. In the metallurgy of iron, when limestone is added to the blast furnace,the calcium ions end up in

A. Slag

B. Gangue

C. Calcium metal

D. $CaCO_3$

Answer: A

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12. In smelting the furnace most suitable is

A. Reverberatory furnace

B. Blast furnace

C. Open hearth furnace

D. Muffle furnace

Answer: B

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13. Flux added in the extraction of iron is

A. Silica

B. Feldspar

C. Limestone

D. Flint

Answer: C

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14. Copper and tin are refined by:

A. liquation

B. cupellation

C. bessemerisation

D. Poling

Answer: D

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15. In the manufacture of iron from haematile, the limestone acts as a

A. A reducing agent

B. Flux

C. Slag

D. Gangue

Answer: B

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16. Blister copper is:

A. impure copper

B. obtained is self-reduction process during bessemersation

C. both (a) and $(b)$are correct

D. none of these

Answer: C

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17. The slag obtained during the extraction of copper from coper pyrites is composed mainly of

A. $CaSiO_3$

B. $FeSiO_3$

C. $CuSiO_3$

D. SiO_2

Answer: B

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18. Tin and zinc can be refined by:

A. cupellation

B. liquation

C. poling

D. bessemerisation

Answer: B

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19. Complex is formed in the extraction of

A. Na

B. Cu

C. Ag

D. Fe

Answer: C

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20. $Ag_2S + NaCN \rightarrow (a)$

(a) $+ Zn \rightarrow (d)$

(b) is a metal. Hence (a) and (b) are

A. $Na_2\left[Zn(CN)_4\right], Zn$

B. $Na\left[Ag(CN)_2\right], Ag$

C. $Na_2\left[Ag(CN)_4\right], Ag$

D. $Na_3\left[Ag(CN)_4\right], Ag$

Answer: B

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21. Which of the following metal is extracted by amalgamation process?

A. Tin

B. Silver

C. Copper

D. Zinc

Answer: B

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22. Leaching of Ag_2S is carried out by heating it with a dilute solution of:

A. $NaCN$only

B. $HC1$

C. $NaOH$

D. $NaCh$ in presence of O_2

Answer: D

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23. The reaction $2ZnS + 3O_2 \rightarrow 2ZnO + 2SO_2$ in the metallurgical process of zinc is called

A. Calcination

B. Cupellation

C. Smelting

D. Roasting

Answer: D

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24. In Mac Arthur Forest method, silver is extracted from the solution of $Na\left[Ag(CN)_2\right]$ by the use of

A. Fe

B. Zn

C. Cu

D. Mg

Answer: B

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25. In blast furnace, the highest temperature is in

A. Reduction zone

B. Slag zone

C. Fusion zone

D. Combustion zone

Answer: D

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26. In which of the following pair of metals, both are commerically extracted from their respective ores by self-reduction method?

A. Zn, Cu

B. Pb, Cu

C. Sn, Zn

D. $A1, Ag$

Answer: B

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27. During extraction of Fe, slag obtained is

A. FeO

B. $FeSiO_3$

C. $MgSiO_3$

D. $CaSiO_3$

Answer: D

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28. Silver from argentiferous lead is obtained by

A. Pattinson's process

B. Parke's process

C. Cyanide process

D. Both (a) and (b)

Answer: C

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29. The final step for the extraction of copper from copper pyrite in Bessemer converter involves the reaction

A. $4Cu_2O + FeS \rightarrow 8Cu + FeSO_4$

B. $Cu_2S + 2Cu_2O \rightarrow 6Cu + SO_2$

C. $2C \cup_2 O + FeS \rightarrow 4Cu + Fe + SO_2$

D. $Cu_2S + 2FeO \rightarrow 2Cu + 2FeCo + SO_2$

Answer: B

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30. Purpose of coke in the blast furnace is

A. fuel

B. alloying element

C. reducing agent

D. both(a) and (c)`

Answer: D

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31. How is limestone used in Fe extraction?

A. Oxidation of Fe ore

B. Reduction of Fe ore

C. Formation of slag

D. Purification of Feformed

Answer: C

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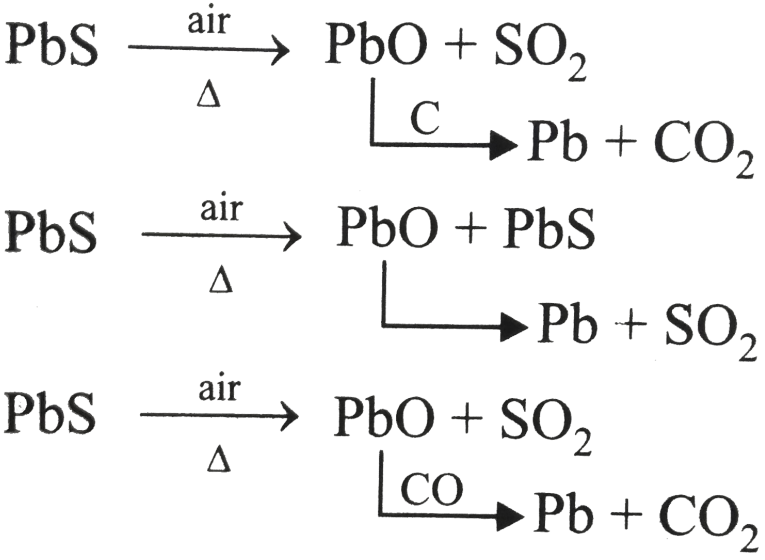
32. Main source of lead is PbS. It is convered to Pb by:



Self- reduction process is:

A. X

B. Y

C. Z

D. none of these

Answer: B

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33. Heating mixture of $Cu_2O$and Cu_2S will give

A. $Cu + SO_2$

B. $Cu + SO_3$

C. $CuO + CuS$

D. Cu_2SO_3

Answer: A

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34. In blast furnace, the hearth is lined with

A. Dolomite refractories

B. Alumina refractories

C. Chromite refractories

D. Carbon refractories

Answer: D

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35. Aluminothermic process is used for the extraction of metals, whose oxides are

A. Fusible

B. Not easily reduced by carbon

C. Not easily reduced by hydrogen

D. Strongly basic

Answer: B

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36. The major role of flourspar, CaF_2 which is added in small amount in the electrolytic reduction of Al_2O_3 dissolved on fused cryolite in fused cryolite is

A. as a catalyst

B. to lower the temperature of the melt and improve the conductivity of cell

C. to decrease the rate of oxidatiom of carbon at the anode

D. to decrease the raet of oxidaiton of carbon at the cathode

Answer: B

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37. In blast furnace, iron oxide is reduced by

A. Silica

B. CO

C. Carbon

D. Limestone

Answer: B

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38. In zone refining, pure metal is obtained at the

A. Right end, if zone is travelling from left to right

B. Left end, if zone is travelling from left ro right

C. Left end, if zone is travelling from right to left

D. Centre, if zone is travelling from any side

Answer: B

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39. The sunstance used in the thermite process of reducing metal ores is

A. Aluminium

B. Thorium

C. Heated Pt gauge

D. Carbon

Answer: A

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40. Which of the following has lowest carbon content?

A. Cast iron

B. Chrome steel

C. Stainless steel

D. Wrought iron

Answer: D

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41. There are following extraction process of silver but not:

A. as a side product in electrolytic refining of copper

B. Parke's process in which Zn is used to extract silver by solvent extraction from molten lead

C. by reaction of silver sulphide with KCN and then reaction of soluble complex with Zn

D. by heating $Na[Ag(CN_2)]$

Answer: D

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42. Identify the metal M whose extraction is based on the following reactions:

$MS + 2O_2 \rightarrow MSO_4$

$2MS + 3O_2 \rightarrow 2MO + 2SO_2$

$MS + 2MO \rightarrow 3M + SO_2$

$MS + MSO_4 \rightarrow 2M + 2SO_2$

A. magnesium

B. aluminium

C. lead

D. tin

Answer: C

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43. Identify the process to which the following reaction belongs:

$Al_2O_3.2H_2O + Na_2CO_3 \rightarrow 2NaAlO_2 + 2H_2O + CO_2$

$2NaAlO_2 + 2H_2O + CO_2 \xrightarrow{50-60^\circ C} Al_2O_3.2H_2O + Na_2CO_3$

A. Hall's process

B. Baeyer's process

C. Serpeck's process

D. None of these

Answer: A

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44. In the extraction of copper, the metal formed in the Bessemer converter is due to the reaction

A. $2Cu_2O + Cu_2S \rightarrow 6Cu + SO_2$

B. $2Cu_2O \rightarrow 4Cu + O_2$

C. $2Cu_2S + 3O_2 \rightarrow 2Cu_2O + 2SO_2$

D. $CuS \rightarrow 2Cu + S$

Answer: A

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45.

$$(Ag+Pb)alloy \xrightarrow{\text{Melt and add zinc}} (Ag+Pb+Zn)\text{melt} \xrightarrow{\text{Cool}} \frac{LayerX}{LayerY}$$

Select correct statements based on above scheme:

A. Layer X contains zinc and silver

B. Layer Y contains lead and silver but amount of silver in this layer is smaller than in the layer X

C. X and Y Are immiscible layers

D. All are correct statements

Answer: D

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46. During the process of electrolyic refining of copper some metals present as impurity settle as anode mud. These are

A. $Fe$and Ni

B. $Ag$and Au

C. $Sn$and Ag

D. $Pb$and Zn

Answer: D

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47. For extraction of sodium from $NaC1$, the electrolytic mixture $Nac1 + Na_3A1F_6 + Cac1_2$ is used. During extractions process,

only sodium is deposited in cathpode but K and Ca do not because

A. Na is more reactive than K and Ca

B. $Na$is less reactive than $K$and Ca

C. $NaC1$ is less stable than Na_3A1F_6 and $CaC1_2$

D. the discharge potential of Na^+ is less than that of K^+ and ca^{2+} ions.

Answer: D

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48. Which iof the following reactions represents the self-reduction process?

A. $\begin{cases} HgS + O_2 \rightarrow HgO + SO_2 \\ HgO + HgS \rightarrow Hg + SO_2 \end{cases}$

B. $\begin{cases} Cu_2S + O_2 \rightarrow Cu_2O + SO_2 \\ Cu_2S + Cu_2O \rightarrow Cu + SO_2 \end{cases}$

C. $\begin{cases} PbS + O_2 \rightarrow PbO + SO_2 \\ PbO + PbS \rightarrow Pb + SO_2 \end{cases}$

D. All of these

Answer: D

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49. x, y and z in the following processes are respectively:

(i) $P_2O_5 + \ldots\ldots x\ldots\ldots\ldots \rightarrow Ca_3(PO_4)_2$

(ii) $2Cu_2O + Cu_2S \rightarrow \ldots\ldots y\ldots\ldots + SO_2 \uparrow$

(iii) $Fe_2O_3 + 3CO \rightarrow \ldots\ldots z\ldots\ldots + 3CO_2 \uparrow$

A. $3Ca, CuSO_4, Fe$

B. $3Ca(OH)_2, 6Cu, FeO$

C. $3CaO, 6Cu, 2Fe$

D. $3CaO_2, CuS, FeO$

Answer: C

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50. Copper Matte is extracted from copper pyrites ore by heating it in blast furnace. The method is based on the principle that:

A. copper has more affinity for oxygen than sulphur at high temperature

B. iron has less affinity for oxygen than sulphur at high temperature

C. sulphur has less affinity for oxygen at high temperature

D. copper has less affinity for oxygen than sulphur at high temperature

Answer: D

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51. Malachite on calcination gives $\rightarrow$ 'A' $+ CO_2 + H_2O$. Compound 'A' on reduction with carbon gives $\rightarrow CO +$ 'B'. Here 'A' and 'B'are:

A. Fe_2, O_3, Fe

B. CuO, Cu

C. $CuCO_3, CuO$

D. MgO, Mg

Answer: B

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52. $2CuCO_3.Cu(OH)_2$ is the formula of

A. Chalcopyrite

B. malachite

C. Siderite

D. Arzurite

Answer: D

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53. Which of the following reaction is a part of Serpeck's process?

A. $A1_2O_3 + 2NaOH \rightarrow 2NaA1O_2 + H_2O$

B. $Fe_2O_3 + 2A1 \rightarrow 2Fe + A1_2O_3$

C. $A1N + 3H_2O \rightarrow A1(OH)_3 + NH_3$

D. $A1_2O_3.2H_2O + 2NaCO_3 \rightarrow 2NaA1O_2 + CO_2 + 2H_2)$

Answer: C

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54. Magnesium is extracted from ore carnallite by :

A. the self-reduction process

B. the carbon-reduction process

C. the electrolytic process

D. treating the ore with aqueous $NaCN$ and then reducing the mixture

Answer: C

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55. Consider the following steps:

$$Cu_2S \xrightarrow{\text{roa st i n air}} A \xrightarrow{\text{Heati ng without air}} B$$

Which is not the correct statement?

A. it is self-reduction

B. A is only Cu_2O and B is a mixture of $Cu$and SO_3

C. $A$is mixture of $Cu_2O$and $Cu_2S$and $B$is a mixture of Cu andSO_2

D. all statements are incorrect.

Answer: B

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56. In the extraction of gold, the cyanide solution acts as a

A. leaching agent that dissolves the impurities

B. Flux

C. leaching agent that acts a complex forming reactant

D. reducing agent that converts the metal oxide or sulphide into the metal

Answer: C

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57. The temperature of the slag zone in the metallurgy of iron using blast furnace is

A. $800 - 1000^{\circ} C$

B. $1200 - 1500^{\circ} C$

C. $400 - 700^{\circ} C$

D. $1500 - 1600^{\circ} C$

Answer: A

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58. $Ag_2S + NaCN \rightarrow (a)$

(a) $+ Zn \rightarrow (d)$

(b) is a metal. Hence (a) and (b) are

A. $Na_2\left[Zn(CN)_4\right], Zn$

B. $Na\left[Ag(CN)_2\right], Ag$

C. $Na\left[Ag(CN)_4\right], Ag$

D. $Na_3\left[Ag(CN)_4\right], Ag$

Answer: B

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59. $NaC1$ and $CaC1_2$ are added to fused $MgC1_2$ in the electrolysis of $Mgc1_2$ since:

A. melting point is decreased and conductivity is increased.

B. melting point is increased and conductivity is decreased

C. melting point and conductivity both are decreased.

D. melting point and conductivity both are increased.

Answer: A

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60. Red bauxite contains chief impurity of ferric oxide but contains some amount of SiO_2 is subjected to Baeyer'sprocess

then select correct reason for SIO_2.

A. SiO_2remains unaffected by reagent of Baeye's process

B. $FeSiO_3$slag is formed by the reaction of $SiO_2$and ferric oxide

C. $SiO_2$is decomposed to produced elementaol $Si$and O_2 gas which removed in the from of vapour

D. SiO_2dissolves in the from of silicate ion

Answer: D

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61. The puddler's candles are produced due to the burning of

A. carbon

B. hydrogen

C. carbon monoxide

D. None of these

Answer: C

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62. Which one of the following metals cannot be extracted by carbon reduction?

A. Zn

B. Fe

C. $A1$

D. Sn

Answer: C

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63. The mette is impure substance obtained during the extraction of

A. copper

B. iron

C. lead

D. aluminium

Answer: A

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64. In electrolysis of $A1_2O_3$by Hall-Heroult process:

A. cryolite $Na_3[A1F_6]$lowers the melting point of $A1_2O_3$and increases its electrical conductivity.

B. $A1$is obtained at cathode and parobably CO_2at anode

C. both$(a)$and(b) are correct

D. none of the above is correct

Answer: C

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65. During the extraction of gold the following reactions takes place

$Au + CN^- + H_2O \rightarrow X, Y + Zn \rightarrow Y + Au$

Here, $X$and Y respectively are

A. $[Au(CN)_4]^{2-}$ and $[Zn(CN)_6]^{4-}$

B. $[Au(CN)_4]^{3-}$ and $[Zn(CN)_4]^{2-}$

C. $[Au(CN)_4]^{2-}$ and $[Zn(CN)_4]^{2-}$

D. $[Au(CN)_2]^{-}$ and $[Zn(CN)_4]^{2-}$

Answer: D

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66. Native silver metel froms a water solube, complesx with a dilute aqueous wsolution of $NaCN$ in the presence of

A. oxygen

B. nitrogen

C. Carbon dioxide

D. argon

Answer: A

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67. Aluminium metal is purified by:

A. Hoopse process

B. Hall-Heroult process

C. Serpeck's process

D. Baeyer's process

Answer: A

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68. Extraction of Ag from sulphide ore and removal of unreacted silver bromide from phorographic plate involve complexes:

A. $\left[Ag(S_2O_3)_2\right]^{3-}$ in both

B. $\left[Ag(CN)_2\right]^{-}$ in both

C. $\left[Ag(S_2O_3)_2\right]^{3-}$, $\left[Ag(CN)_2\right]^{-}$ respectively

D. $\left[Ag(CN)_2^{-}\right.$, $\left[Ag(S_2O_3)_2\right]^{3-}$ respectively

Answer: D

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69. In the electrolytic refining of zinc,

A. the impure metal us not of zinc

B. graphite is at the anode

C. the metal ion gets reduced at the anode

D. acidified zinc sulphate is the electrolyte

Answer: D

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70. Silver can be separated form lead by:

A. fractional crystallisation

B. liquation

C. cupellation

D. addition of zinc(Parake's method)

Answer: D

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71. Identify the reaction that does not take place in a blast furnace

A. $CaCO_3 \rightarrow CaO + CO_2$

B. $CaO + SiO_2 \rightarrow CaSiO_3$

C. $CO_2 + C \rightarrow 2CO$

D. $2Fe_2O_3 + 3C \rightarrow 4Fe + 3CO$

Answer: D

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72. when compared to ΔG° for the formation of $A1_2O_3$ the Δg° for the formation of Cr_2O_3 is

A. lower

B. higher

C. same

D. unpredicted

Answer: B

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73. The method of zone relining of metal is based on the principle of $AIFMIT-2003)$

A. greater mobility of the pure metal than that of impurity

B. highest melting point of the impurity than that of the pure metal

C. gerater noble character of the solid metal than that of the impurity

D. greater solubility of the impurity in the molten state then in the solid

Answer: D

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74. In the exteraction of copper from its sulphide ore, the metal is fanally obtained by the reduction of caprous oxide with

A. FeS

B. CO

C. Cu_2S

D. SO_2

Answer: C

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75. Which does not represent correct method?

A. $TiC1_2 + 2Mg \rightarrow Ti + 2MgC1_2 \quad : Kroll$

B. $Ni(CO)_4 \rightarrow Ni + 4CO \quad : Mond$

C. $Ag_2CO_3 \rightarrow 2Ag + CO_2 + O_2 \quad : vanArket$

D. $ZrI_4 \rightarrow Zr + 2I_2 \quad : vanArket$

Answer: C

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76. Purification of aluminium is called

A. Baeyer's process

B. Bosch process

C. Hoopes process

D. Castner's process

Answer: C

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77. Which of the following statements is correct regrading the slag obtained during the extraction of a metal like copper or iron?

A. The slag is lighter and has lower melting point than the metal

B. The slag is heavier and has lower melting point than the metal

C. The slag is lighter and has higher melting point han the metal

D. The slag is heavier and has higher melting point than the metal

Answer: A

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78. Gold is extracted by hydrometallurgical procees based on its property

A. of bing electropositive

B. of being less reactive

C. to form salts which are water soluble

D. to form complexes which are water soluble

Answer: D

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79. In the metallurgy of aluminium_____

A. $A1^{3+}$ is oxidised to $A1(s)$.

B. graphite anode is oxidised to carbon monoxide and carbon dioxide.

C. oxidation state of oxygen changes in the reaction at anode.

D. oxidation state of oxygen changes in the overall reaction involved in the process.

Answer: B

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80. In the metallurgy of iron, the upper layer obtained in the bottom of blast furnace mainly contains:

A. $CaSiO_3$

B. spongy iron

C. Fe_2O_3

D. $FeSiO_3$

Answer: A

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81. During Hoppes process for electrolytic refining of $A1$, the middle layer is of

A. cryolite and NaF_2

B. impure aluminium

C. pure $A1$

D. alloys of $A1$, $Ca$and Si

Answer: A

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82. The processes used in the refining of aluminium and metals respectively are

A. Cupellation and fractional distillation

B. Hoopes process and cupellation

C. poling and fractional distillation

D. Hoopes process and fractional distillation

Answer: D

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83. In the extraction of aluminium

Process X: employed for red bauxite to remove iron oxide (main impurity)

Process Y: (Serpeck's process): used for while bauxite to remove Z (main impurity) then,

Select correct option for the process X and impurity Z.

A. $X =$ Hall and Heroult's process and $Z = SiO_2$

B. $X =$ Bayer's process and $Z = SiO_2$

C. $X =$ Serpeck's process and $Y =$ iron oxide

D. $X =$ Bayer's process and $Y =$ iron oxide

Answer: B

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84. Thermite is a mixture of iron oxide and ---------- ? .

A. zinc powder

B. Aluminium powder

C. Sodium metal

D. potassium metal

Answer: B

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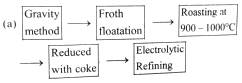
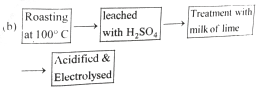
85. Which of the following diagrams us correctly related to different steps involved in the extraction of Zn from zinc blende ore?

A. 

B. 

C. Both (a) and (b)

D. None of these

Answer: C

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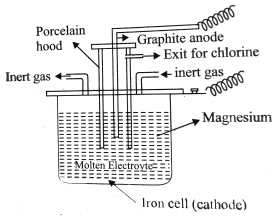
86. Magnesium is extracted electrolysing fused magnesium chloride containing $NaC1$ and $CaC1_2$ using:

A. a nickel cathode and a graphite anode.

B. the iron container as anode and a nickel cathode.

C. the iron container as cathode and a graphite rod as anode.

D. the nickel container as cathode and iron as anode.



Answer: C

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87. Which is an alloy of aluminium?

A. Magnalium

B. Duralumin

C. Brass

D. Both$(a)$and`(b)

Answer: D

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88. In the electrolyic refining of copper using $CuSO_4$ as electrolyte the anode reaction is

A. $4OH^- \rightarrow O_2 + 2H_2O + 4e^-$

B. $Cu^2 + 2e^- \rightarrow Cu$

C. $2SO_4^{2-} \rightarrow S_2O_8^{2-} + 2e^-$

D. $Cu \rightarrow Cu^{2+} + 2e^-$

Answer: D

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89. In the electrolysis of molten alumina during the manufacture of aluminium:

A. $A1_2O_3$undegoes dissociation

B. cryolite undergoes dissociation

C. $A1_2O_3$and cryolite both undergo dissociation

D. Neither of the two undergoes dissociation

Answer: B

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90. Which one of the following metals has the largest abundance in the earth's crust?

A. Magnesium

B. Calcium

C. Aluminium

D. Sodium

Answer: C

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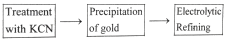
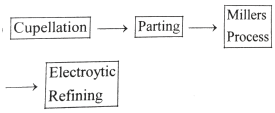
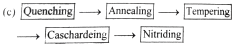
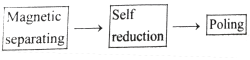
91. Which of the following diagram is correctly related to refining of gold?

A. 

B. 

C. 

D. 

Answer: B

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92. Select correct statement regrading silver extraction//purification process.

A. When the lead-silver alloy is rich in silver, lead is removed by the cupellation process.

B. Lead is removed from argentiferous lead by Parke's process.

C. Zinc froms an alloy with lead, from which lead is separated by distillation.

D. Zinc forms an alloy with silver, from which zinc is separated by distiallation.

Answer: D

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93. The processes used in the refining of aluminium and metals respectively are

A. Cupellation and fractional distillation

B. Hoopes process and cupellation

C. Poling and fractional distillation

D. Hoopes process and fractional distillation

Answer: D

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94. Which one of the following is the major impurity in pig iron?

A. Silicon

B. Sulphur

C. Graphite

D. Phosphorus

Answer: C

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95. The anode mud obtained during electrorefining of copper may contain.

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96. In sulphation roasting of ZnS products are

A. $ZnO + ZnSO_4 + SO_2$

B. $ZnO + SO_2$

C. $ZnCI_2$

D. $Zn + SO_2$

Answer: A

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97. In van Arkel method, if I_2 is introducted at $1800K$ anode impure zironium metal, the product will be:

A. iodide of the nmetal

B. pure metal

C. inpuritiesreact with iodine

D. none of these

Answer: D

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Section B Assertion Reasoning

1. Assertion: van method is used to prepare ultrapure samples of some metals.

Reason: It involves reaction of CO with metals to form volatile carbony,s which decompose on heating to give pure metal.

A. If both assertion and reason are true and the reason is the correct explanation of the assertion.

B. If both assertion and reason are true but reason is not the correct explanation of the assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: C

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2. Assertion: Metal ores with are either not reduced by carbon or which forms carbides are reduced by Na.

Reason: Na is strong reducing agent.

A. If both assertion and reason are true and the reason is the correct explanation of the assertion.

B. If both assertion and reason are true but reason is not the correct explanation of the assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: D

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3. Assertion: Sulphide ores are usually concentrated by froth floatation process.

Reason: Magnetic ores are usually concentrated by gravity method.

A. If both assertion and reason are true and the reason is the correct explanation of the assertion.

B. If both assertion and reason are true but reason is not the correct explanation of the assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: C

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4. Assertion: All minerals are ore.

Reason: Ores are minerals from which metal can be extracted conveniently and economically.

A. If both assertion and reason are true and the reason is the correct explanation of the assertion.

B. If both assertion and reason are true but reason is not the correct explanation of the assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: D

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5. Assertion: Nickel is purified by reaction it with CO.

Reason: Impurities present in nickel form volatile compounds.

A. If both assertion and reason are true and the reason is the correct explanation of the assertion.

B. If both assertion and reason are true but reason is not the correct explanation of the assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: C

Watch Video Solution

6. Assertion: Aluminothermy is used for extraction of chromium form chromium oxide.

Reason: Alumina has a high melting point.

A. If both assertion and reason are true and the reason is the correct explanation of the assertion.

B. If both assertion and reason are true but reason is not the correct explanation of the assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: B

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7. Assertion: Ag and Au are extracted by leaching the ores with a dilute solution of $NaCN$.

Reason: Impurities associated with these ores dissolve in $NaCN$.

A. If both assertion and reason are true and the reason is the correct explanation of the assertion.

B. If both assertion and reason are true but reason is not the correct explanation of the assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: C

Watch Video Solution

8. Assertion: Carbonate and hydroxide orea re concentrated by froth floatation process.

Reason: In froth floataiton process, pine is used because it preferentially wets the ore particles.

A. If both assertion and reason are true and the reason is the correct explanation of the assertion.

B. If both assertion and reason are true but reason is not the correct explanation of the assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: D

Watch Video Solution

9. Assertion: $A1$ is obtained by high temperature reduction of alumina with carbon.

Reason: Alumina reacts with carbon to form $A1_2O_3$ which does not decompose.

A. If both assertion and reason are true and the reason is the correct explanation of the assertion.

B. If both assertion and reason are true but reason is not the correct explanation of the assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: D

Watch Video Solution

10. Assertion: Durig calcination the ore is heated well below its melting point in the limited supply of air or absence of air.

Reason: The process of calcination is carried out for sulphide ores.

A. If both assertion and reason are true and the reason is the correct explanation of the assertion.

B. If both assertion and reason are true but reason is not the correct explanation of the assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: C

Watch Video Solution

11. Assertion: Electropositive metals like Mg, $A1$ are extracted by electrolysis of their slat solutions.

Reason: Highly electropositive metals cannot be reduced by chemical reduction methods.

A. If both assertion and reason are true and the reason is the correct explanation of the assertion.

B. If both assertion and reason are true but reason is not the correct explanation of the assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: D

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12. Assertion: In Hall-Heroult process aluminium is extracted by the electrolytic reduction of alumina dissolved in molten cryolite or fluorspar.

Reason: The cryolite ore fluorspar lower the melting point of melt an dmake it more conducting

A. If both assertion and reason are true and the reason is the correct explanation of the assertion.

B. If both assertion and reason are true but reason is not the correct explanation of the assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: B

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13. Assertion: In extraction of copper from chalcopyrite after roasting in supply of air ai moderate temperature, the temperature of the roasting ore is increased above the fusion temperature and then silica is added in reverberatory furnace.

Reason: In the extraction of copper from chalcopyrites during

smelting, the impurity of iron is removed as fusible slag $(FeSIO_3)$ in blast furnace or reverberatory furnace.

A. If both assertion and reason are true and the reason is the correct explanation of the assertion.

B. If both assertion and reason are true but reason is not the correct explanation of the assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: D

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14. Assertion: Extraction of zinc from sphalerite ore involes the roasting followed by reduction with coke.

Reason: Zinc can be extracted by hydrometallurgy.

A. If both assertion and reason are true and the reason is the correct explanation of the assertion.

B. If both assertion and reason are true but reason is not the correct explanation of the assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: C

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15. Assertion: Silica is added as a flux in reverberatory furnace, in the extrcation of copper from copper phyrites.

Reason: Silica decreases the melting point of the ore and increases the conductivity.

A. If both assertion and reason are true and the reason is the correct explanation of the assertion.

B. If both assertion and reason are true but reason is not the correct explanation of the assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: C

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16. Statement-I : Wolframite impurities are separated from cassiterite by electromagnetic separation

Statement-II : Cassiterite being magnetic is attached by the magnet and forms a separate heap.

A. If both assertion and reason are true and the reason is the correct explanation of the assertion.

B. If both assertion and reason are true but reason is not the correct explanation of the assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: C

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17. Assertion: Wrough iron is prepared from cast iron by oxidising impurities in a reverberatory furnace lined with

haematite.

Reason: Haematite oxidises carbon to carbon monoxide.

A. If both assertion and reason are true and the reason is the correct explanation of the assertion.

B. If both assertion and reason are true but reason is not the correct explanation of the assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: B

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Aipmt Neet Questions

1. Which one of the following ores is a chloride?

A. Horn silver

B. Zincite

C. Bauxite

D. Felspar

Answer: A

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2. The substance used in the thermite process of reducing metal ores is

A. Aluminium

B. Thorim

C. Heated Ptgauge

D. Carbon

Answer: A

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3. The method of zone relining of metal is based on the principle of $AIFMIT-2003)$

A. Greater mobility of the pure metal than that of impurity

B. Greater solubility of pure metal than that of impurity

C. Higher meltingpoint of the impurity than that of pure metal

D. Greater noble character of the solid metal than that of the impurity

Answer: A

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4. Which of the following is not an ore of magnesium?

A. Magnesite

B. Dolomite

C. Gypsum

D. Carnalite

Answer: C

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5. Which of the following srtatement above the advantage of masting of sulphide are before reduction is not true?

A. ΔG_f° of the sulphide is greater than CS_2 and H_2S

B. ΔG_f° is negative for roasting of sulphide ore to oxide

C. Roasting of the sulphide to oxide is thermodynamically feasible

D. Carbon and hydrogen are suitable reducing agents for metal sulphides

Answer: D

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6. Sulphide ore of metal are usually concentrated by froth flotation process .Which one of the following sulphide3 ores after an exception and is contrated by electrical leaching?

A. Argentite

B. Copper pyrite

C. Sphalerite

D. Galena

Answer: A

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7. Which of the following pairs of metals uis purified by van arkel method?

A. $Zr$and Ti

B. $Ga$and In

C. NiandFe

D. AgandAu

Answer: A

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8. In the exteraction of copper from its sulphide ore, the metal is fanally obtained by the reduction of caprous oxide with

A. Copper (I)sulphide(Cu_2S)

B. Carbon monoxide (CO)

C. Iron sulphide (FeS)

D. Sulphur dioxide (SO_2)

Answer: A

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9. Whch of the following is a mineral of iron?

A. Pyrolusite

B. Magnetite

C. Malachite

D. Cassiterite

Answer: B

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10. Roasting of sulphides given the gas X as a by producet. This is a colortess gas with choking smell of burnt and causes great dumage to respiratory is acidic, act as a resulting agent and in acid never been isolated .The gas X is

A. CO_2

B. SO_2

C. SO_3

D. H_2S

Answer: B

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11. Metals are ususally not found as nitates in the ores" Out of the following two (a and b) reaction which is ..are true for the

above abservation ?

Metal nitrates are bighly unstable

Metal nitrates are bighly soluble in water

A. $I$is false but$II$is ture

B. $I$is true but II is false.

C. $I$and $II$are true

D. $I$and$II$are false

Answer: A

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12. 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

Answer: C

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13. Considering Ellingham diagram, which of the following metals can be used to reduce alumina?

A. Fe

B. Zn

C. Mg

D. Cu

Answer: C

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Aiims Questions

1. The molecular formula of cryolite is

A. Fe_3O_4

B. Na_3A1F_6

C. $Na_2A1_2O_3$

D. All of these

Answer: B

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2. The ore carnallite is represented by structure:

A. $Na_2A1_2O_3$

B. Na_3A1F_6

C. $KC1.\ MgC1_26H_2O$

D. Fe_3O_4

Answer: C

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3. The most important ore of tin is

A. cassiterite

B. cryolite

C. cerussite

D. none of these

Answer: A

Watch Video Solution

4. Which of the following is a carbonate ore?

A. Pyrolusite

B. Malachite

C. Diaspore

D. Cassiterite

Answer: B

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5. Calcination is used in matallurgy for removal of

A. water and sulphide

B. water and CO_2

C. $CO_2$and H_2S

D. $H_2O$and H_2S

Answer: B

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6. Flux is used to remove

A. acidic impurities

B. basic impurities

C. all impurities form ores

D. both (a) and (b)

Answer: D

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7. Roasting is doen in

A. blast furnace

B. open herath furnace

C. Electric furnace

D. none of these

Answer: A

Watch Video Solution

8. Heating of ore in presence of air to remove sulphure impurities is called

A. Calcination

B. roasting

C. Smelting

D. none of these

Answer: B

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9. Which method of purification is represented by the following equations

$$Ti + 2I_2 \xrightarrow{523K} TiI_4 \xrightarrow{1700K} Ti + 2I_2$$

A. Cupellation

B. Poling

C. van Arkel

D. zone refining.

Answer: C

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10. Lapis-Lazuli' is a blue coloured precious stone. It is mineral of the class

A. sodium-alumino silicate

B. zinc cobaltate

C. basic copper carbonate

D. prussian blue

Answer: A

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11. During the process of electroytic refining of copper some metals present as impurity settle as 'anode mud'. These are

A. $Sn$and Ag

B. $Pb$and Zn

C. $Ag$and Au

D. $Fe$and Ni

Answer: C

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12. Gold is extracted by hydrometallurgical procees based on its property

A. of bing electropositive

B. of being less reactive

C. to form complexes which are water soluble

D. to form salts which are water soluble

Answer: C

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13. van Arkel method of purification of metals involves converting the metal to:

A. volatile stable compound.

B. volatile unstable compound

C. non-volatile stable compound

D. none of the above

Answer: A

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Assertion Reasoning Questions

1. Asseretion: Iton is found in the free state in nature.

Reason: Iron is highly reactive element.

A. If both assertion and reason are true and the reason is the correct explanation of the assertion.

B. If both assertion and reason are true but reason is not the correct explanation of the assertion.

C. If the assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: D

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2. Assertion: During calcinations, the ore is heated well below its melting point in the limited supply of oxygen.

Reason: The process of calcinations is carried out for sulphide ores.

A. If both assertion and reason are true and the reason is the correct explanation of the assertion.

B. If both assertion and reason are true but reason is not the correct explanation of the assertion.

C. If the assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: C

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3. Assertion : Hydrometallurgy involves dissolving the ore in a suitable reagent followed by precipitation by a more electropositive metal.

Reason : Copper is extracted by hydrometallurgy.

A. If both assertion and reason are true and the reason is the correct explanation of the assertion.

B. If both assertion and reason are true but reason is not the correct explanation of the assertion.

C. If the assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: B

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Section D Chapter End Test

1. Consider the following statements in the extraction of iron from haematite:

(I) $CO$is the main reducing agent

(II) $Fe_2O_3$is used to oxidise the impurities be Bessemer process

(III) In basic oxygen process, air is used to oxidise the impurities.

(IV) When air is used to oxidise the impurities, iron nitride is formed in iron

Pick the correct set of statement (s):

A. I, IV

B. I, II

C. $I, II \text{and} III$

D. $I, II \text{and} IV$

Answer: A

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2. Oxygen and hydrogen gases are produced at the anode and cathode respectively during electroysis of dilute eq.solution of:

A. Na_2SO_4

B. $AgNO_3$

C. HCI

D. $CuSO_4$

Answer: A

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3. The major role of flourspar, CaF_2 which is added in small amount in the electrolytic reduction of Al_2O_3 dissolved on fused cryolite in fused cryolite is

A. as a catalyst

B. to lower the temperature of the melt and improve the conductivity of cell

C. to decrease the rate of oxidatiom of carbon at the anode

D. to decrease the raet of oxidaiton of carbon at the cathode

Answer: B

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4. In extractive metallurgy of lead, the reduction of the roasted ore to the molten metal by heating with coke is called:

A. smelting

B. roasting

C. calcinations

D. none of these

Answer: A

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5. The main reaction occuring in blast furnace during the extraction of iron form haematite is

A. $Fe_2O_3 + 3C \rightarrow 2Fe + 3CO$

B. $CO_2 + C$

C. $FeO + SiO_2 \rightarrow FeSiO_3$

D. $CaO + SiO_2 \rightarrow CaSiO_3$

Answer: D

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6. Select similarity between alkali metals and coinage metals

A. Both are required to store in organic solvent

B. Both have high solubility in pure liquid ammonia to produce blue soltuion

C. Both can be extracted by aqueous salt electrolysis

D. Both have same number of electron (s) in outermost shell

Answer: D

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7. If the impurity in a metal has a greater affinity for oxygen and is more easily oxidised than the matel, then the purification of metal may be carried out by:

A. cupellation

B. electroytic refining

C. zone refining

D. poling

Answer: A

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8. In which of the following proeces, roasting and self-reduction is required?

A. $Cu_2S \rightarrow Cu_2O$

B. $CaCO_3 \rightarrow CaO$

C. $ZnS \rightarrow Zn$

D. $PbD \rightarrow Pb$

Answer: D

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9. Extraction of Ag from sulphide ore and removel of unreacted silver bromide from photogrphic plate involve complexes:

A. $\left[Ag(S_2O_3)_2\right]^{3-}$ in both

B. $\left[Ag(CN)_2\right]^{-}$ in both

C. $\left[Ag(S_2O_3)_2\right]^{3-}$, $\left[Ag(CN)_2\right]^{-}$ respectively

D. $\left[Ag(CN)_2^{-}\right.$, $\left[Ag(S_2O_3)_2\right]^{3-}$ respectively

Answer: D

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10. Which of the following has maximum thermodynamic spontaneity at $400^\circ C$?

A. $C + O_2 \rightarrow CO_2$

B. $2C + O_2 \rightarrow 2CO$

C. $2CO + O_2 \rightarrow 2CO_2$

D. All have same

Answer: C

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11. van Arkel method of purification of metals involves converting the metal to:

A. volatile stable compound.

B. Volatile unstable compound

C. Nonvolatile stable compound

D. None of the above

Answer: A

Watch Video Solution

12. Gold is extracted by hydrometallurgical procees based on its property

A. Of bing electropositive

B. Of being less reactive

C. To form complexes which are water soluble

D. To form salts which are water soluble

Answer: C

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13. Lapis-Lazuli' is a blue coloured precious stone. It is mineral of the class

A. Sodium-alumino silicate

B. Zince cobaltate

C. Basic copper carbonate

D. Prussian blue

Answer: A

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14. Which process of reduction of mineral to the matel is suited for the extraction of copper from its ores with low copper content

A. Metal displacement

B. Auto reduction

C. Chemical reduction

D. Electroytic reduction

Answer: B

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15. Which is correct

A. Galena: Mg_2CO_3

B. Cassiterite: $CaCO_3MgCO_3$

C. Dolomite: SnO_2

D. Magnesite: $MgCO_3$

Answer: D

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16. Wolframite ore is separated from tinstone ore by the process of

A. Roasting

B. Electromagnetic

C. Smelting

D. Calcination

Answer: B

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17. In order to refine “blister copper” it is metled in a furnace and is stirred with green logs of wood. The purpose is

A. To expel the dissolved gasesd in blister copper

B. To bring the impurities to surface and oxidize them

C. To increase the carbon content of copper

D. To reduce the metallic oxide impurities with hydrocarbon gases liberated from the wood

Answer: D

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18. Which of the following metal is extracted by amalgamation process?

A. Tin

B. Silver

C. Copper

D. Zinc

Answer: B

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19. The final step for the extraction of copper from copper from copper pyrite in Bessmer converter involves the reaction

A. $4Cu_2O + FeS \rightarrow 8Cu + FeSO_4$

B. $Cu_2S + 2Cu_2O \rightarrow 6Cu + SO_2$

C. $2Cu_2O + FeS \rightarrow 4Cu + Fe + SO_2$

D. $Cu_2S + 2FeO \rightarrow 2Cu + 2FeCo + SO_2$

Answer: B

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20. How is limestone used in Fe extraction?

A. Oxidation of Fe ore

B. Reduction of Fe ore

C. Formation of slag

D. Purification of Feformed

Answer: C

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21. Cassiterite is concentrated by

A. Levigation

B. Electromagnetic separation

C. Floatation

D. Liquefaction

Answer: B

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

A. Galena

B. Cassiterite

C. Magnetite

D. Malachite

Answer: A

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23. Which ore contains both iron and copper?

A. Cuprite

B. Chalcocite

C. Chalcopyrite

D. Malachite

Answer: C

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24. Formula of Felspar is

A. $K_2O.\ A1_2O_3.6SiO_2$

B. $K_2O_3.\ A1_2O_3.6Si_2.\ O_2.2H_2O$

C. $A1_2O_3.2SiO_2.2H_2O$

D. $3MgO.4SiO_2.\ H_2O$

Answer: A

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25. Iodine is obtained commercially from Chile saltpetre through the reaction

A. $NaNO_3$

B. KNO_3

C. Na_2SO_4

D. $Na_2S_2O_3$

Answer: A

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26. Which of the following is not an ore of magnesium?

A. Magnesite

B. Dolomite

C. Gypsum

D. Carnallite

Answer: C

Watch Video Solution

27. Mark the wrong statement

A. Wrought iron is prepared by heating cast iron in a reverberatory furnace

B. The impurity present in cast iron are oxidised by air

C. The impurities are oxidised by Fe_2O_3

D. COburns with blue flame and the Si, Mn and other impuritites from slag with silica

Answer: B

Watch Video Solution

28. Assertion: In forth floatation method, sodium ethy1 xaanthetae is used as a collector.

Reason: It helps the sulphide ore to collect on the air bubble.

A. If both assertion and reason are true and the reason is the correct explanation of the assertion.

B. If both assertion and reason are true but reason is not the correct explanation of the assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: A

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29. Assertion: Sulphide ores of $Zn$and Pb are generally converted into their respective oxides, prior to reduction.

Reason: The zinc oxide and lead oxide are reduced by carbon to their respective free metals.

A. If both assertion and reason are true and the reason is the correct explanation of the assertion.

B. If both assertion and reason are true but reason is not the correct explanation of the assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: A

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30. Assertion: ΔG° for reaction less negative on increasing temperture.

$2CO + O_2 \rightarrow 2CO_2$

Reaosn: Carbon monoxide burns with blue flame.

A. If both assertion and reason are true and the reason is the correct explanation of the assertion.

B. If both assertion and reason are true but reason is not the correct explanation of the assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: B

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