CHEMISTRY

BOOKS - NIKITA CHEMISTRY (HINGLISH)

GENERAL PRINCIPLES & PROCESSES OF ISOLATION OF ELEMENTS

Multiple Choice Questions

1. Which is not correct statement ?

A. Casseterite, chromite and haematitie are concentrated by hydraulic washing (Tabling).

B. Pure Al_2O_3 is obtained from 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 dulphate and part of sulphide may also act as a reducing agent

Answer: C

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2. $NaCN$ is sometimes added in the froth flotation process as a depressant when ZnS and PbS minerals are expected because :

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

B. ZnS forms 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 forth floatation process

Answer: B

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3. Select incorrect reduction process

A. $2\left[Ag(CN)_2\right]^- + Zn \rightarrow \left[Zn(CN)_4\right]^{2-} + 2Ag$

B. $CuO + H_2 \rightarrow Cu + H_2O$

C. $ZnO + H_2 \rightarrow Zn + H_2O$

D. $MgO + C \rightarrow Mg + CO$

Answer: C

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4. An important ore of magnesium is

A. Dolomite

B. Amblygonite

C. Cinnabar

D. Galena

Answer: A

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5. In the thermite welding process we use

A. Fe and Al

B. Ferric oxide and Aluminium powder

C. Barium peroxide and Magnesium powder

D. Cu and Aluminium

Answer: B

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6. Aluminium is obtained by

A. Reducing Al_2O_3 with coke

B. Electrolysing Al_2O_3 dissolved in Na_3AlF_6

C. Reducing Al_2O_3 with cryolite

D. Heating Al_2O_3 and cryolite

Answer: B

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7. Hoope's process is used in the refining of

A. Al

B. Zn

C. Ag

D. Cu

Answer: A

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8. All alumns contain

A. One monovalent and one trivalent metal

B. Both movovalent metal

C. One divalent and monovalent metal

D. Both divalent metals

Answer: A

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9. Aluminium vessels should not be washed with materials containing washing soda because -

A. Washing soda is expensive

B. Washing soda is easily decomposed

C. Washing soda reacts with aluminium to form soluble aluminate

D. Washing soda reacts with aluminium to form insoluble aluminium oxide

Answer: C

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10. Froth Floatation process is based on:

A. Specific gravity of the ore particles

B. Magnetic properties of the ore particles

C. Wetting properties of the ore particles

D. Electrical properties of the ore particle

Answer: C

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11. Electrolytic reduction process is used for the altercation of

A. Alkali metal

B. Alkaline earth metals

C. Aluminium

D. All the above

Answer: D

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12. In the froth floatation process for the facilitation of ores the ore particles float because

A. They are light

B. Their surface is not easily weted by water

C. They bear electrostatic charges

D. They are insoluble

Answer: D

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13. Which one of the following metals can not be obtained on electrolysis of aqueous solution of its salts?

A. Ag

B. Mg

C. Cu

D. Au

Answer: B

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14. Cryolite is:

A. Na_3AlF_6 and is used in the electrolyusis of alumina for decreasing electrical conductivity

B. Na_3AlF_6 and is used in the electroysis of alumina for lowering the melting point of alumina

C. Na_3AlF_6 and is used in the electrolytic purification of alumina

D. Na_3AlF_6 and is used in the electrolysis of alumina

Answer: B

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15. What are coinage metals ? Give example .

A. normal elements

B. transition elements

C. Active elements

D. Highly electropositive element

Answer: B

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

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

B. $Cu_2S \rightarrow 2Cu + S$

C. $Fe + Cu_2O \rightarrow 2Cu + FeO$

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

Answer: A

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17. In Bayer's process. $Al(OH)_3$ in heating gives

A. $NaAlO_2$

B. Al_2O_3

C. AlH_3

D. CO_2

Answer: B

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18. Silver from argentiferous lead is obtained by

A. Parkes process

B. Solvay process

C. Cyanide process

D. Amalgamation process

Answer: A

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19. Bessemer converter is used for

Atomic nos, $Mn = 25, Fe = 26, Co = 27, Ni = 28$

A. Pig iron

B. Steel

C. Wrought iron

D. Cast iron

Answer: B

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20. Stainless steel contain

A. Au

B. Ag

C. Mn

D. Fe

Answer: D

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21. Blister copper is:

A. Pure copper

B. Copper containing 2% impurity

C. Alloy of copper

D. None

Answer: B

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22. Formula of ruby copper is

A. Cu_2O

B. Cu_2S

C. $CuFeS_2$

D. $Cu(OH)_3.CuCO_3$

Answer: A

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23. 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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24. Name the chemical formula of zinc blende and galena.

A. Zinc oxide

B. Sulphide

C. Lead sulphide

D. Copper pyrites

Answer: C

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25. Two prevent corrosion iron pipes carrying drinking water are coated with zinc. The process involved is

A. Alloy formation

B. Electroplating

C. Galvanising

D. Soldering

Answer: C

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26. Name the metal which is used for galvanising iron.

A. Deposition of Zn on Fe

B. Deposition of Al on Fe

C. Deposition of Sn on Fe

D. Deposition of Cu on Fe

Answer: A

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27. The chemical formula of wallemite is

A. ZnO

B. $ZnCO_3$

C. ZN_2SiO_4

D. ZnS

Answer: C

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28. Red how steel rod on suddenly immersing in water becomes

A. Soft and malleable

B. Hard and brittle

C. Tough and ductile

D. Fibrous

Answer: B

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29. Spiegeleisen is an alloy of

A. Fe and Mn

B. Fe, Mn, C

C. Fe, Mn and Cr

D. Fe and Cr

Answer: B

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30. In blast furnace, the highest temperature is in

A. Blast furnace

B. reverberatory furnace

C. Electrical furnace

D. Muffle furnace

Answer: C

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31. The common method of extraction of metals from oxide ores is

A. reduction with carbon

B. reduction with hydrogen

C. reduction with Aluminium

D. Electrolystic method

Answer: A

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32. High purity copper metal is obtained by

A. Carbon reduction

B. Hydrogen reduction

C. Electrolytic method

D. Thermite process

Answer: C

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33. Copper reduces

A. Na

B. Al

C. Mg

D. None

Answer: D

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34. In blast furnace, iron oxide is reduced by

A. CO

B. C

C. SiO_2

D. $CaCO_3$

Answer: A

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35. The colour of zinc sulphide is

A. Yellow

B. White

C. Brown

D. Black

Answer: B

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36. The formula of haematite is

A. Fe_3O_4

B. Fe_2O_3

C. $FeCO_3$

D. FeS_2

Answer: B

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37. From a solution of $CuSO_4$ the metal used to recover copper is

A. Na

B. Ag

C. Hg

D. Fe

Answer: D

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38. The formula of limonite is

A. $ZnCO_3$

B. $2Fe_2O_3.3H_2O$

C. $CaCO_3.MgCO_3$

D. $CaCO_3$

Answer: B

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39. In metallurgy, flux is a substance used to convert

A. Mineral into silicate

B. Fusible impurities to infusible impurities

C. Infusible impurities to soluble impurities

D. Soluble impurities to infusible impurities

Answer: C

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40. Which of the following benefication processes is used for the mineral $Al_2O_3.2H_2O$?

A. Froth floatation

B. Leaching

C. Liquation

D. Magnetic separation

Answer: B

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41. Write about Alumino thermic process with examples.

A. An oxidising agent

B. A flux

C. A reducing agent

D. Soldering

Answer: C

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42. In the electrolysis of alumina, cryolite is added to

A. Lower the melting point of alumina

B. Increase the electrical conductivity

C. Both a and b

D. Remove impurities from alumina

Answer: C

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43. Aluminium is more reactive than iron. But aluminium is less easily corroded than iron because.

A. Aluminium is a nobel metal

B. Oxygen form a protective oxide layer

C. Iron undergoes reaction easily with water

D. Iron from both mono and divalent ions

Answer: B

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44. Heating pyrites to remove sulphur is called

A. roasting

B. Calcination

C. Smelting

D. Fluxing

Answer: A

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45. The main function of roasting is

A. To remove the volatile impurities

B. Oxidation

C. Reduction

D. to make slag

Answer: D

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46. Zone refining is a method to obtain

A. Very high temperature

B. Ultrapure Al

C. Ultrapure metals

D. Ultrapure oxide

Answer: C

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47. 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: B

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48. Electrolytic reduction method is used fro the extraction of

A. Highly electronegative element

B. Transition metal

C. Metalloids

D. Highly electropositive element

Answer: D

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49. When copper is placed in the atmosphere for sufficient time, a green crust is formed on its surface. The composition of the green crust is:

A. $Cu(OH)_2$

B. CuO

C. $CuCO_3$

D. $CuCO_3.Cu(OH)_2$

Answer: D

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50. Roasting of copper pyrites is done

A. To remove moisture and volatile impurities

B. To oxide free sulphur

C. To decompose pyrites in to Cu_2S and FeS

D. All of the above

Answer: D

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

A. Slag

B. Gangue

C. Metallic calcium

D. Calcium carbonate

Answer: A

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

A. Cu_2S

B. $FeSiO_3$

C. $CuSiO_3$

D. SiO_2

Answer: B

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53. Copper matte consists of:-

A. $FeSiO_2$

B. $SiO_2 + FeS$

C. $FeS + Cu_2S$

D. $CuS + SiO_2 + FeO$

Answer: C

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54. Which method is based on distribution principle?

A. Mond's process

B. Parkes process

C. Cupellation process

D. Polling process

Answer: B

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55. Which statement about corrosive sublimate is incorrect ?

A. It is prepared by heating mercury and chlorine

B. It reduce stannic chloride

C. It oxidises stannous chloride

D. It sublimes readily

Answer: B

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56. Iron is obtained on large scale from haematite Fe_2O_3

A. By reduction

B. By oxidation

C. By reduction followed by oxidation

D. By oxidation followed by reducting

Answer: D

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57. Polling process us used in the purification of

A. Ge

B. Bi

C. Cu

D. Fe

Answer: C

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58. Spelter is

A. Impure Cu

B. Impure Zn

C. ZnO

D. CuO

Answer: B

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59. Roasting is used during metallurgical operation using

A. Galena

B. Iron pyrites

C. Copper glance

D. All

Answer: D

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60. Pig iron is converted into strrl by decreasing the amount of carbon present in it in a

A. Blast furnace

B. Pyrite burner

C. Bessemer converter

D. None of these

Answer: C

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61. Near the top of the blast furnace, iron oxides are reduced to ..... by carbon monoxide .

A. Carbon

B. CO

C. CO_2

D. Lime stone

Answer: B

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62. Hoop's process of purification of aluminium involves formation of layers during electrolysis. This is because

[True/False (T = True, F= False)]

(i) the three layers have same densities but different materials

(ii) the three layers have different densities

(iii) the upper layer is of pure aluminium which acts as a cathode

(iv) the bottom layer is of impure a aluminium which acts

as an anode and middle layer consists of NaF, BaF_2 and AlF_3

A. FTTF

B. FTTT

C. TTFT

D. FFTF

Answer: B

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63. During electrorefining of a metal, impure metal is made anode.

A. gangue

B. flux

C. anode mud

D. slag

Answer: C

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64. In Ellingham diagram, the slope of the carve of the formation metal oxide:

A. it becomes more stable with decrease in temperature

B. it becomes more stable with increase in temperature

C. there is no effect of temperature on stability

D. it used as a reducing agent for all oxides

Answer: B

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65. Which of the following statement (s) is (are) correct for the extractive metallurgy of aluminium ?

(1) Red bauxite contains the impurities of iron oxides SiO_2 and TiO_2

(2) Red bauxite is purified by hall's and Serpeck's process

(3) Hall - Heroult process is used for the electrolytic reduction of molten alumina dissolved in molten cryolite

(4) In electrolytic reduction of alumina fluorine gas is liberated at anode as by product

A. 1, 2

B. 1, 3

C. 1, 4

D. 3, 4

Answer: B

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66. Which of the following processe (s) during the extraction of copper from chalcopyrites ?

(1) Froth floatation (2) Roasting

(3) Bassemerisation (4) Leaching

A. 1, 2

B. 1, 3

C. 1, 2, 3

D. 3, 4

Answer: C

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67. Polling process is used for the refining of

(1) Iron (2) Copper

(3) Tin (4) Lead

A. 1, 2

B. 2, 3

C. 1,4

D. 3, 4

Answer: B

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68. Calcium silicate (slag) formed in the slag formation zone is extraction of iron from haematite ore

I. does not dissolve in molten iron

II. being lighter floats on the moltern iron

III. Is used in cement industry

IV. prevents the re-oxidation of molten iron

A. 1, 2

B. 1, 3

C. 1, 4

D. $1, 2, 3, 4$

Answer: D

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69. The major role of fluorpar (CaF_2) which added in small quantities in the electrolyte reduction of alumina dissolved in fused cryolite (N_3AlF_6) is

A. 1, 2

B. 2, 3

C. 1, 4

D. 3, 4

Answer: B

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70. Why is the extraction of copper from pyrites more difficult than that from its oxide ore through reduction?

A. Magnetic

B. Leaching

C. Froth floatation process

D. Gravity separation

Answer: C

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71. Which of the following statement (s) is /are correct ?

(1) Cuprite and Zincite are oxide ores

(2) Magnesite and carnallite are carbonate ores

(3) Chalcocite and azurite are ores of copper

(4) Felspar and mica mineral contain aluminium

A. 1, 2

B. 1, 3

C. 1, 4

D. $1, 3, 4$

Answer: D

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72. Electrolytic reduction of alumina to aluminium by the Hall-Heroult process is carried out

A. in the presence of NaCl

B. in the presence of fluorite

C. in the presence of cryolite which forms a melt at lower temperature and increases the electrical conductivity

D. in the presence of cryolite which forms a melt at higher temperature and increases the electrical conductivity

Answer: C

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73. Slag is formed by reaction between

A. impurities and coke

B. impurities and ore

C. impurities and flux

D. flux and coke

Answer: C

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74. Dolomite is mineral whose formula is

A. $CaMg(CO_3)_2$

B. $MgCO_3$

C. $CaCO_3 . MgCO_3$

D. (a) and (c) both

Answer: D

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75. In the purification of aluminium by Hoope's process, impurities of silicon and copper are added to molten aluminium in order to

A. make the melt conducting

B. lower the melting point of the melt

C. smooth deposite of aluminium

D. make the melt heavier

Answer: D

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76. The slag consists of molten impurities, generally, in the form of

A. Metal carbonate

B. Metal silicate

C. Metal oxide

D. Metal nitrate

Answer: B

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77. Gravity seperation process may be used for the concentration of

A. copperpyrite

B. Bauxite

C. Haematite

D. Calamine

Answer: C

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78. In electrorefining of metal the impure metal is made the anode and strip of pure metal the cathode during the

electrolysis of an aqueous solution of a complex metal salt.

This method cannot be used for refining of

A. Silver

B. Copper

C. Aluminium

D. Gold

Answer: C

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79. The chemical formula of siderite

A. FeO_3

B. $FeCO_3$

C. Fe_3O_4

D. FeS_2

Answer: B

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80. 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 than the metal

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

Answer: A

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81. During extraction of iron from haematite, the flux used is _____.

A. Silica

B. Calcium silicate

C. Lime stone

D. Coke

Answer: C

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82. In smelting of iron, reactions takes place in Blast furnace at $400^\circ C - 600^\circ C$ is

A. $CaO + SiO_2 \rightarrow CaSiO_3$

B. $2FeS + 3O_2 \rightarrow 2Fe + SO_2$

C. $FeO + SiO_2 \rightarrow FeSiO_3$

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

Answer: D

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83. Chemical used as a depressant in separatin ZnS from PbS in froth-floatation process , is

A. Na_2SO_4

B. $NaCl$

C. $NaCN$

D. NaOH

Answer: C

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84. 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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85. The chemical formula of diaspore an ore of alumium is

A. $Al_2O_3.\ H_2O$

B. Al_2O_3

C. $Al_2O_3.2H_2O$

D. $Al(OH)_3$

Answer: A

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86. In electrorefining of copper,some gold is deposited as

A. Cathode

B. Cathode mud

C. Anode mud

D. Electrolyte

Answer: C

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87. Themite is the mixture of

A. $Cr_2O_3 + Al$

B. $Cu + Mg$

C. $Zn + Mg$

D. $Fe + Al$

Answer: A

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88. If carbon is present in cast iron in the form of cementite' then it is known as

A. White cast iron

B. Grey cast iron

C. Wrought iron

D. None of these

Answer: A

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89. The following reaction is involved in the Hall's method of purification of bauxite

A. $Al_2O_32H_2O + 2NaOH \rightarrow 2NaAIO_2 + 3H_2O$

B.

$$Al_2O_3.2H_2O + Na_2CO_3 \rightarrow 2NaAIO_2 + 2H_2O + CO_2$$

C. $Al_2O_3.2H_2O + 3C + N_2 \rightarrow 2AIN + 3CO + 2H_2O$

D. None of these

Answer: B

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90. Heating mixture of Cu_2O and Cu_2S will give

A. Cu_2SO_3

B. $CuO + CuS$

C. $Cu + SO_3$

D. $Cu + SO_2$

Answer: D

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91. During the process of electrolyic 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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92. Which of the following is a carbonate ore?

A. pyrolusite

B. malachite

C. bauxite

D. cassiterite

Answer: B

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93. In the extraction of Cu from its sulphide ore, the metal is formed by reduction of Cu_2O with

A. FeS

B. CO

C. Cu_2S

D. SO_2

Answer: C

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

A. Magnetite

B. Cassiterite

C. Galena

D. Malachite

Answer: C

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95. When the sample of copper with the zinc impurity is to be purified by electrolysis, the appropriate electrodes are

A. $\begin{matrix} \text{Cathode} & \text{Anode} \\ \text{Pure Copper} & \text{Pure Zinc} \end{matrix}$

B. $\begin{matrix} \text{Cathode} & \text{Anode} \\ \text{Pure Zinc} & \text{Pure Copper} \end{matrix}$

C. $\begin{matrix} \text{Cathode} & \text{Anode} \\ \text{Pure Copper} & \text{Impure Copper} \end{matrix}$

D. $\begin{matrix} \text{Cathode} & \text{Anode} \\ \text{Pure Zinc} & \text{Impure Zinc} \end{matrix}$

Answer: C

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96. Which of the following is not an ore of Iron

A. Limonite

B. Cassiterite

C. Magnetite

D. None of these

Answer: B

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97. Aluminium is extracted in the electrolysis of :

A. Alumina

B. Bauxite

C. Molten cryolite

D. Alumina mixed with molten cryolite

Answer: D

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98. Which of the following is magnetite ?

A. Fe_2O_3

B. $MgCO_3$

C. $Na_2Al_2O_3$

D. $KCl.\ MgCl_2.\ 6H_2O$

Answer: A

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99. The purification of alumina is called

A. Baeyer's process

B. Bosch process

C. Castner process

D. Hoop's process

Answer: A

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100. Bauxite is purified by

A. Hall's process

B. Serpeck's process

C. Baeyer's process

D. All of those

Answer: D

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101. Which of the following is a sulphide ore?

A. Carnallite

B. Magnetite

C. Copper pyrites

D. Malachite

Answer: C

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102. At what temperature carbon monoxide reduces ferric oxide to Fe ?

A. 900 K

B. 1200 K

C. 2000 K

D. 500 K

Answer: A

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103. The molecular formula of Glauber's salt is

A. $MgSO_4.7H_2O$

B. $CuSO_4.5H_2O$

C. $FeSO_4.7H_2O$

D. $Na_2SO_4.10H_2O$

Answer: D

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104. Off the following, the metals that cannot be obtained by electrolysis of the aqueous solution of their salts are

(1) Ag (2) Mg (3) Cu and (4) Al

A. 1, 2

B. 2, 3

C. 3, 4

D. 2, 4

Answer: D

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105. During Hoope's process for eelctrolytic refining of Al, the middle layer is of

A. impure Al

B. mixture of cryolite and BaF_2

C. impure Al_2O_3

D. Cryolite only

Answer: B

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106. Among following statement, 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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107. In the commercial electrochemical process for aluminium extraction, the electrolyte used is

A. $Al(OH)_3$ in NaOH solution

B. an aqueous solution of $Al_2(SO_4)_3$

C. a molten mixture of Al_2O_3 and Na_3AlF_6

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

Answer: C

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108. The chemical processes in the production of steel from haematite ore involve

A. reduction

B. Oxidation

C. reduction followed by oxidation

D. oxidation followed by reduction

Answer: D

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

A. $Fesi O_3$

B. $Ca_3 AlO_3$

C. $CuFeS_2$

D. $Cu_2S + FeO$

Answer: B

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110. Which of the following process is used in the extractive metallurgy of magnesium ?

A. Fusel salt electrolysis

B. Self reduction

C. Aqueous solution electrolysis

D. Thermite reduction

Answer: A

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111. Which ore contains both iron and copper?

A. Cuprite

B. Chalcocite

C. Chalcopyrite

D. Malachite

Answer: C

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112. Extraction of zinc from zinc blende is achieved by:

A. electrolytic reduction

B. roasting following by reduction with carbon

C. roasting followed by reduction with another metal

D. roasting followed by self-reduction

Answer: B

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113. Select correct statement

A. In the decomposition of an oxide into oxygen and gaseous metal, entropy increases

B. Decomposition of an oxide is an endothemic change

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

D. All are correct statements

Answer: D

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114. 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. Al_2O_3

B. Cu_2O

C. MgO

D. ZnO

Answer: B

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115. According to Ellingham diagram Cr_2O_3 reduced by

A. Al

B. Cu

C. Mg

D. Zn

Answer: A

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116. Ellingham diagram represents:

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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117. To carry out a reduction process, select a temperature so as to make

A. ΔG negative

B. ΔG positive

C. ΔH negative

D. ΔH positive

Answer: A

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