

CHEMISTRY

BOOKS - MARVEL CHEMISTRY (HINGLISH)

GENERAL PRINCIPLES AND PROCESSES OF ISOLATION OF ELEMENTS

Multiple Choice Questions

1. The processing of extracting , metal in pure form

fromits ore is known as

A. Purification

B. Metallurgy

C. Refining

D. Electrolysis

Answer: B

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2. Froth floatation process is based on

A. preferential adsorption of gangue particles by

oil

B. specific gravity of ore particles

C. preferential wetting of ore particles by soil

D. magnetic properties of gangue

Answer: C

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3. The oil used in the floatation method for the purification of ores is

A. Pine

B. Coconut

C. Groundnut

D. Olive

Answer: A

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4. During smelting, an additional substance is added which combines with impurities to form a fusible product. The substance added is known as :

A. Ore

B. Flux

C. Slag

D. Gangue

Answer: B



5. The method of zone refining of metals is based on the principle of :

A. greater mobility of the pure metal than that of

the impurity

B. higher melting point of the impurity than that

of the pure metal

C. greater solubility of the impurity in the molten

state than in the solid

D. greater noble character of the solid metal than

that of the impurity

Answer: C

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6. The etraction of metals from oxide ores involves

A. Hydrolysis

B. Decarboxilation

C. Electrolysis

D. Reduction



8. The process of ore dressing is carried out to

A. add flux to the mineral

B. remove the volatile impurities

C. convert the ore to oxide

D. remove the siliceous materials

Answer: D

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9. The purpose of smelting an ore is

A. add flux to the mineral

B. remove the volatile impurities

C. convert the ore to oxide

D. remove the siliceous materials



10. In smelting process the impurities of an ore is removed by

A. addition of flux

B. levigation

C. addition of slag

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D. liquation

Answer: A



11. Which of the following is not a smelting process ?

A. addition of flux

B. levigation

C. addition of slag

D. Liquation

Answer: A



12. Identify the process when an ore is heated in limited supply of air.

A.
$$2Cu_2S + 3O_2
ightarrow 2Cu_2O + 2SO_2$$

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

 $\mathsf{C}. \ PbO + C \rightarrow Pb + CO$

D. $Al_2O_3+3C
ightarrow 2Al+3CO$

Answer: C



13. Identify the prcess when an ore is heated in the presence of oxygen.

A. Smelting

B. Roating

C. Calcination

D. Liquation

Answer: B



14. Which of the following is sugarcane?

- A. Waste material left after concentration
- B. Waste material left after purification of metal
- C. Waster material after electrolysis
- D. Waste material present in ore to be removed

during concentration

Answer: D

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15. For which one of the following polling is used ?

A. Reducing metal oxide

B. Oxidising metal to oxide

C. Oxidising impurities

D. Recuding metal sulphate to metal sulphide

Answer: A

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16. What type of flux is used when the sugarcane is

acidic ?

A. Acidic

B. Basic

C. Neutral

D. Alcoholic

Answer: B

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17. Which of the following is correct?

A. Gangue + Flux = Slag

B. Froth + Slag = Gangue

C. Gangue + Slag = Flux

D. Flux + Slag = Gangue



18. A naturally occurring substance from which a metal can be profitably extracted is known as

A. Ore

B. Slag

C. Gangue

D. Mineral

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Answer: D



19. Discharge potential relates to the potential at which

A. the metal is discharged at the anode

B. the metal is discharged at the cathode

C. the metal ion is discharged

D. the metal is reduced

Answer: B



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20. The discharge potential do not dependent on

A. the position of metal in the electrochemical

series

B. the concentration of metal in the periodic table

C. the position of metal ions in the electrolyte

D. the temperature of the cell

Answer: D

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21. Use of electrolysis is .

A. Electroplating

B. Removal of electrons

C. Electrorefining

D. Both (a) and (c)

Answer: D

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22. Calcination is used in matallurgy for removal of

A. Water and sulphide

B. Water and H_2S

C. Water and CO_2

D. Water and CO

Answer: C

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23. Van Arkel method of purification of metals involves

converting the metal to

A. Volatile compound

B. Volatile unstable compound

C. Non-volatile stable compound

D. Non-volatile unstable compound

Answer: B

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24. Electrochemical process (electrolysis of fused salt)

is empolyed to extract

A. Iron

B. Lead

C. Sodium

D. Silver

Answer: C
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25. Heating pyrites in air to remove sulphur is known
as
A. Calcination
B. Fluxing
C. Smelting
D. Roating

Answer: D



26. Refractory materials are generally used in furnaces

because

A. do not require replacement

B. possess great strength

C. can withstand high temperature

D. are chemically inert

Answer: C



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27. Zone refining process is used for the

A. purification of ore

B. purification of metal

C. concentration of an ore

D. reduction of metal oxide

Answer: B



28. Which of the following metals are found in native

state ?

A. Cu, Pt, Mg

B. Ag, Pt, Au

C. Al, Ag, Zn

D. Au, Pb, Fe

Answer: B

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29. Cryolite is

A. $Al_2O_{32}H_2O$

B. Na_3AlF_6

$\operatorname{C.}Al(OH)_4O_5$

D. $KAlSi_3O_8$

Answer: B

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30. Formula of Magnetite is ______

A. Fe_2O_5

 $\mathsf{B.}\,FeO$

 $\mathsf{C}.\,Fe_3O_4$

D. Fe_2O_3



Answer: B



32. Which of the following are contains copper and

iron?

A. Siderite

B. Copper pyrites

C. Iron pyirtes

D. Chalcocite

Answer: B

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33. Zincite is _____

A. ZnO

B. $ZnCO_3$

C. $ZnSO_4$

D. ZnS

Answer: A

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34. Malachite ore is

A. $CuO \cdot CuCO_3$

 $\mathsf{B.}\, CuCO_3 \cdot Cu(OH)_2$

 $\mathsf{C.}\, CuO\cdot Cu(OH)_2$

D. $Cu_2O \cdot Cu(OH)_2$

Answer: B

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35. Which of the following is a carbonate ore?

A. Siderite

B. Alumina

C. Calamine

D. Malachite

Answer: D Watch Video Solution **36.** _____ and _____ are ores of Aluminium . A. Bauxite and Malachite B. Cuprite and Calamine C. Bauxine and kaolinite D. Cuprite and Kaoline Answer: C



37. Pulverisation is _____.

A. a process of breaking big pumps into small

lumps

B. a process of concentration of ores

C. ore dressing

D. a process of fine powdering ores

Answer: D

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38. In which of the following minerals, Aluminium is not present ?

A. Cryolite

B. Fluorspar

C. Mica

D. Feldspar

Answer: B



39. Which of the follwing is not ore ?

A. Zinc blende

B. Malachite

C. Pig iron

D. Bauxite

Answer: C

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40. Zinc is extracted by _____.

A. the carbon reduction ZnO.

B. the carbon monoxide reduction of ZnO

C. the hydrogen reduction of ZnO

D. the copper reduction of ZnO

Answer: A

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

A. roasting followed by reduction with carbon

B. roasting followed by reduction with other metal

C. roasting followed by self-reduction

D. electrolytic reduction

Answer: A
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42. Zinc is obtained by the electrolysis of
Λ 7ης
A. 2113
B. ZnO
C. $ZuCO_3$
D. $ZnSO_4$
Answer: D
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43. Specific gravity of zinc metal is _____.
A.
$$4.14gcm^{-3}$$

B. $5.14gcm^{-3}$
C. $6.14gcm^{-3}$
D. $7.14gcm^{-3}$
Answer: D
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44. Boiling point of pure zinc metal is _____

A. 193 K

B. 692 K

C. $920^{\,\circ}C$

D. $1193^{\,\circ}\,C$

Answer: C

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45. Atomic radius of zinc is _____

A. 290 pm

B. 198 pm

C. 138 pm

D. 74 pm

Answer: C

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46. Which of the following minerals does not contain

iron?

A. Magnesite

B. Magnetite

C. Haematite

D. Limonite

Answer: A

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47. The principal reducing agent in the metallurgy of

iron is _____.

A. Aluminium

B. Carbon

C. Carbon monoxide

D. Carbon dioxide



- $\mathrm{B.}\,2C+O_2\to 2CO$
- $\mathsf{C}. \operatorname{CO}_2 + \operatorname{C} o \operatorname{CO}_2$

Verine a list

D. $Fe_2O_3 + 3CO
ightarrow 2Fe + 3CO_2$

Answer: A

49. Which of the following faction is of no significance for roasting sulphide ores to the oxide and not subjecting the sulphide ores in carbon reduction directly?

A. Metal sulphides are less stable that the corresponding oxides B. Metal sulphides are thermodynamically more stable than CS_2

C. CO_2 is thermodynamically more stable than

D. CS_2 is less volatile than CO_2

Answer: B

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50. In extraction of iron, limestone is used for

A. Formation of slag

B. Reduction of Fe ore

C. Purification of Fe formed

D. Oxidation of Fe ore

Answer: A



51. The process of isolation of metals by dissolving the ore in a suitable chemical reagent followed by precipitation of the metal by a more electropositive metal is called

A. Electro-refining

B. Zone refining

C. Hydrometallurgy

D. Electrometallurgy

Answer: C





52. The temperature of $3000^\circ\,$ C is obtained

A. in open hearth

B. by electric arc

C. in blast furnace

D. in muffle furnace

Answer: B



53. Ferromagnetism is exhibited only below

A. 842 K

B. 1042 K

C. 742 K

D. 642 K

Answer: B

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54. In metallurgy of iron hot air is blown in blast furnace through ______.

A. an inlet

B. a tapping hole

C. tuyeres

D. an outlet

Answer: C

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55. The reduction of Fe_2O_3 to Fe by CO occurs

arround _____.

A. 873 K

B. 1031 K

C. 1123 K

D. 1213 K

Answer: A

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56. Percentage of carbon is pig iron is about

A. 2

B.4

C. 5

D. 6

Answer: B

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57. The hot waste gases escape from blast furance are

A. SO_2, N_2, CO

B. N_2, CO_2, SO_2

 $\mathsf{C}. N_2, CO, CO_2$

 $\mathsf{D}.NO_2, CO, SO_2$

Answer: C



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58. Purification of aluminum by electroysic refiering is

known as

A. Baeyer process

B. Hoope process

C. Serpeck

D. Hall process

Answer: B

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59. In electrorefining of metals, impure metal is made anode and a strip of pue metal is the cathode during the electrolysis of an aqueous solution of complex metal salt. The method cannot be used for refining of

A. Al

B. Cu

C. Au

D. Ag

Answer: A



60. 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. as a catalyst

B. to make the fused conducting mixture

C. to lower the fusion temperature of the molten

mass

D. to reduce the rate of oxidation of the carbon at

anode.

Answer: C

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

A. decrease the electrical conductivity

B. remove impurities from alumina

C. lower the melting point of alumina

D. minimise the anode effect

Answer: C



62. In the commercial electrochemical process for aluminium extraction, the electrolyte used is

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

B. an aqueous solution of $Al(OH)_3$ and NaOH

C. a molten mixture of $Al(OH)_3$ and $CaCO_3$

D. a molten mixture of Al_2O_3 and Na_3AlF_6

Answer: D



63. Which of the following minerals does not contain

aluminium?

A. Fluorspar

B. Feldspar

C. Cryolite

D. Mica

Answer: A



64. The chief ore of aluminium is

A. Aluminia

B. Potash alum

C. Bauxite

D. Cryolite

Answer: C

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65. In self-reduction, the reducing species is

A. S

 $\mathsf{B.}\,S^{2\,-}$

C. O^{2-}

D. SO_2

Answer: B

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66. Which one of the following metals has the largest

abundance in the earth's crust?

A. Calcium

B. Aluminium

C. Magnesium

D. Sodium

Answer: B

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67. The auto reduction process is not used in the metallurgy of

A. Fe

B. Cu

C. Pb

D. Ag



used for the mineral $Al_2O_3.2H_2O$?

A. Liquation

B. Leaching

C. Froth flotation

D. Magnetic separation

Answer: B



69. In the aluminothermite process, aluminium is

A. an oxidising agent

B. a reducing agent

C. a flux

D. a solder

Answer: B

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70. The electronic configuration of aluminium is

A. $1s^2 2s^2 2p^6 3s^2 3p^1$

B. $1s^2 2s^2 2p^6 3s^2 3p^3$

C. $1s^2 2s^2 2p^6 3s^2$

D. $1s^2 2s^2 2p^6 3s^2 3p^2$

Answer: A

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71. Heating mixture of Cu_2O and Cu_2S will give

A. CuS+CO

 $\mathsf{B.}\,Cu+SO_3$

 $\mathsf{C.}\,CuO+SO_2$

 $\mathsf{D}. Cu + SO_2$

Answer: D

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72. Copper pyrites is roasted in a current of air of

remove

A. sulphur and FeO

B. FeO only

C. Arsenic and FeO

D. Sulphur and Arsenic

Answer: D



73. Copper is the most noble of the first row transition elements it occurs in small deposits in several countries. Ores of Copper include chalcanthite $(CuSO_{4.5}H_2O)$, atacamite $[Cu_2Cl(OH)_3]$, cuprite (Cu_2O) , copper glance (Cu_2S) , and malachite $[Cu_2(OH)_2CO_3]$. However, 80% of the world copper production comes from the ore chalcopyrite $(CuFeS_2)$. Extraction of copper from chalcopyrite includes roasting, iron removal, and self-reduction.

- Q. Partial roasting of chalcopyrite produces
 - A. Cu_2O and FeO
 - $B. Cu_2S$ and FeO
 - C. CuO and Fe_2O_3
 - $\mathsf{D}.\,CuO \ \text{and} \ FeS$

Answer: B



74. In the metallurgy of copper, matte is molten mass

A. Cu and FeS

B. CuO and Fe

 $C. Cu_2S$ and FeS

 $D. Cu_2O$ and FeO

Answer: C

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75. Copper is mainly extracted from _____

A. Malachite

B. Copper pyrites

C. Cuprite

D. Azurite

Answer: B

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76. The composition of cuprite is

A. CuS

B. FeS. CuS

 $C. Cu_2O$

D. $CuS. CuCO_3$



- C. Slag
- D. Cuprous oxide

Answer: B



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78. During smelting silica is added to roasted copper

ore to remove

A. Cuprous Sulphide

B. Cuprous Oxide

C. Ferrous oxide

D. Ferrrous sulphide

Answer: C



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79. The hot waste gases escapes from Bessemer converter are

A. $CO + CO_2$

- $\mathsf{B.}\,N_2+SO_2$
- $\mathsf{C.}\,CO_2+SO_2$
- $D.NO_2 + SO_2$

Answer: C



80. Select incorrect reduction process in respective extraction of an element :

A.
$$8Al + 3Mn_3O_4 \xrightarrow{\Delta} 4Al_2O_3 + 9Mn$$

B. $2ZnS + C \xrightarrow{\Delta} 2Zn + CS_2$
C. $FeO + C \xrightarrow{\Delta} Fe + CO$
D. $2[Ag(CN)_2]^- + Zn \rightarrow [Zn(CN)_4]^{2-} + 2Ag$

Answer: B



81. In the equation:

 $M+8CN^-+2H_2O+O_2
ightarrow 4ig[M(CN)_2ig]^-+4OH^-$ metal M is:

A. Copper

B. Gold

C. Zinc

D. Iron

Answer: B

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82. Electrorefining is used for

A. Na

B. Mg

C. Cu

D. Cl_2

Answer: C



83. The chemical processes in the production of steel

from haematite ore involve
A. reduction followed by oxidation

B. oxidation

C. oxidation followed by reduction

D. reduction

Answer: C

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84. Electrometallurgy is employed for the extraction

of

A. Cu

B. Fe

C. Na

D. Ag

Answer: C

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85. The underlying of blast furnace is made of

A. Silica bricks

B. Fire clay bricks

C. Basic bricks

D. Graphite

Answer: B

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86. Cast iron is made by melting

A. pig iron with zinc

B. pig iron with scrap iron and tin

C. pig iron with scrap iron and coke

D. pig iron with lead and zinc

Answer: C



87. During prepartion of wrought iron, CO and SO_2

formed escape whereas to form slag.

A. MnO and SiO_2 combine

B. Mn and Si combine

C. Mg and Si combine

D. MgO and SiO_2 combine

Answer: A



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88. Alloy aluminium bronze is composed of

A. 92 % Al + 8 % Ni

 $\mathsf{B.}\,95\,\%\,Al+5\,\%\,Cu$

C. 80 % Cu + 10 % Al + 10 % Zn

D. 80 % Al + 10 % Cu + 10 % Zn

Answer: B

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89. Brass consist of _____ percent of copper .

B.40

C. 60

D. 80

Answer: C

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90. Which of the following alloy contains four components ?

A. Nickel steel

B. Chrome steel

C. Alnico

D. Invar

Answer: C



91. Duralumin composed of _____ metals

- A. 2
- B. 3
- C. 4

D. 5





93. _____ being tough and resistant to rusting is used for making agricultural implements.

A. Brass

B. Duralumin

C. Wrought Iron

D. Bronze

Answer: C

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94. The main function of roasting is

A. Concentration

B. Reduction

C. Oxidation

D. Isolation

Answer: C

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95. The ores that are concentration by flotation method are :

A. Carbonates

B. Sulphides

C. Oxides

D. Phosphate

Answer: B

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96. The substance which reacts with gangue to form

fusible mineral is called _____

A. Slag

B. Ore

C. Flux

D. Catalyst

Answer: C

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97. Which of the following concentration processes

will you use when the gangue is light?

A. Magnetic separation

B. Froth flotation

C. Electrostatic seperation

D. Gravity separation

Answer: D

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98. When the impurities are removed from an ore, the

metal becomes liable to

A. Calcination

B. Oxidation

C. Magnetic concentration

D. Reduction



C. Blast furnace

D. All of these

Answer: C



100. In which of the following roasting is carried out ?

A. Bessemer converter

B. Reverberatory furnace

C. Muffle furnace

D. Oven

Answer: B



101. The component having low melting point can be

separated in an impure metal by _____

A. washing with water

B. froth flotation

C. liquation

D. magnetic separation

Answer: C

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102. The process of extraction of metal in the molten

state is called _____

A. Pyrometallurgy

B. Hdryometallurgy

C. Calcination

D. Roasting

Answer: A

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103. The hottst part of the blast furnace is

A. Hearth

B. Tuyers

C. Outlet for gases

D. Euternace for charge

Answer: A

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104. Which of the following metals is obtained by

leaching its ore with dilute cyanide solution ?

A. Silver

B. Titanium

C. Vanadium

D. Zinc



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106. Froth floatation process for the concentration of ores is an illustration of the pratical application of

A. Colloidal State

B. Absorption

C. Coagulation

D. Sedimentation

Answer: A



107. The reason for floating of ore particles in concentration by froth floatation process is that:

A. being hydrophobic

B. being charged

C. being light

D. being insoluble

Answer: A



108. The salt which is least likely to be found in mineral is

A. Chloride

B. Sulphides

C. Sulphates

D. Nitrates

Answer: D



109. Which one of the following is the ore of iron?

A. Limonite

B. Malachite

C. Calamine

D. Kaolinite

Answer: A

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110. Which ore contains both iron and copper?

A. Malachite

B. Chalcophyrite

C. Chalcocite

D. Azurite

Answer: B



111. The formula of kaolinite is ______

A. $AlSi(OH)_7$

B. $Al_2(OH)SiO_3$

 $\mathsf{C.}\,Al_2(OH)_4Si_2O_5$

 $\mathsf{D.}\, Al(OH)_3SiO_2$



Answer: B

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113. The ore having two different metal atoms is

A. Copper pyrites

B. haematite

C. Magnetite

D. Haematite

Answer: A

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114. The chief ore of zinc is

A. Cryolite

B. Calcite

C. Calamine

D. Cuprite

Answer: C

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115. Zinc blende ore can be concentrated by _____.

A. Leaching

B. Froth flotation

C. Levigation

D. Gravity separation

Answer: B

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116. Consider the following reactions at $1000^{\circ}C$.

(A)
$$Zn_{(s)} + rac{1}{2}O_{2(g)} o ZnO_{(s)}, \Delta G^\circ = -360$$

kJ/mol

(B)
$$C_{(\text{gra})} + rac{1}{2} O_{2(g)} o CO_{(g)}, \Delta G^\circ = -460$$

kJ/mol

correct statement at $1000\,^\circ C$ is

A. Zinc can be oxidised by carbon monoxide

B. Zinc blend is produced during the reaction

C. zinc oxide can be reduced by graphite

D. zinc can be oxidised by graphite

Answer: C

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117. The incorrect statement among the following is

A. germanium and gallium amoung the following

is _____.

B. in the metallurgy of iron, flux used is Si

C. ZnO is made into brickettes with coke

D. aluminium is extracted by Baeyer's process

Answer: B

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118. Fe_2O_3 is reduced to spongy iron near the top of

blast furnace by

A. CO

B. CO_2

C. C

 $\mathsf{D}.\,H_2$

Answer: A

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119. Fe_2O_3 is converted to FeO in the presence of CO

at _____

A. 473-573 K

B. 573-673 K

C. 673-773 K

D. 773-873 K

Answer: D

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120. Thermite is a mixture of

- A. oxide of manganese and aluminium
- B. aluminium powder and oxide of chromium
- C. oxide of manganese and chromium
- D. aluminium and manganese powder.

Answer: B



121. Which of the following methods is used for obtaining aluminium metal ?

A. By heating alumina in Muffle furnace

B. By a process called pyrometallurgy

C. Electrolysing fused purified alumina and cryolite

D. By heating alumina with carbon

Answer: C



122. Which of the following combination represents the correct matching of metals with the most commonly employed ores for their extraction ?

A. Fe : Chalcocite , Al : Bauxite

B. Fe : Siderite, Al: Clay

C. Fe : Haematite , Al : Bauxite

D. Fe : Haematite , Al : Cryolite

Answer: C

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123. Which of the following statement is true ?

A. The process of obtaining aluminium bv electrolysis of a mixture of aluminium oxide and cryolite is called Haber's process B. Cryolite is added during metallurgy of a aluminium to reduce alumina C. Bauxite is purified by leaching with a hot concentrated solution of NaOH D. Bauxite is purified by zone refining

Answer: C



124. In the extraction of Cu from its sulphide ore, the

metal is formed by reduction of Cu_2O with

A. Cu_2S

 $\mathsf{B.}\,FeS$

C. *CO*

D. C

Answer: A


125. During roasting of copperr pyrites the major reaction observed is _____.

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

B. $CuFeS_2 + 3O_2 \rightarrow FeO + CuO + SO_2 \uparrow$
C. $CuFeS_2 + O_2 \rightarrow Cu_2S + 2FeS + SO_2 \uparrow$
D. $2CuS + 3O_2 \rightarrow 2CuO + 2SO_2 \uparrow$

Answer: C



126. During reduction of CuO, impurity of FeO can be

removed by adding _____

A. an acidic flux , SiO_2

B. a basic flux , limestone

C. a basic flux, SiO_2

D. an acidic flux , CaF

Answer: A

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127. Copper can be extracted from

A. self-reduction method

B. carbon reduction method

C. electrolysis method

D. leaching followed by carbon reduction

Answer: A

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128. The formula of azurite is :

A. Cu_2S

B. $CuFeS_2$

 $C.Cu(OH)_2 \cdot 2CuCO_3$

D. Cu_2O



A. $2Fe_2O_3+3C
ightarrow 4Fe+3CO_2$

 $\mathsf{B.}\, CO_2 + C \to 2CO$

 $\mathsf{C}.\,FeO+SiO_2\to FeSiO_2$

D. $CaCO_3
ightarrow CaO + CO_2$

AAVELEL AVELEE @ LEFT.

Answer: C



130. Which of the following reactions taking place in the blast furnace during extraction of iron is endothermie ?

A.
$$CaCO_3
ightarrow CaO + CO_2$$

- B. $2C + O_2$
- $\mathsf{C}.\,C+O_2 o CO_2$
- D. $Fe_2O_3+3CO
 ightarrow 2Fe+3CO_2$

Answer: A



131. 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 into infusible impurities

Answer: B



132. Which of the following process is used for the extractio of group 1?

A. Electrolysis of aqueous solution of a salt

B. Reduction with carbon

C. Redcution of hydrogen

D. Electrolysis of fused chloride

Answer: B



133. The percentage of carbon in pig iron, wrougth iron and cast iron is in the order of _____.

A. pig iron < cast iron > wrought iron

B. pig iron > cast iron > wrought iron

C. pig iron = cast iron < wrought iron

D. pig iron < cast iron < wrought iron

Answer: B



134. For production of steel _____ is used .

A. AOP

B. BOP

C. COP

D. DOP

Answer: D

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135. Stainless steel contains

A. 60% Fe, 27% Cr, 10% Ni, 3% C

B. 69% Fe, 17 % Cr, 12% Ni, 2% C

C. 73% Fe, 18% Cr, 8% Ni, 1% C

D. 73% Fe, 17% Cr, 9% Ni, 1%C

Answer: B

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136. The order of percentage of copper in brass, bronze and german silver is _____.

A. Brass=Bronze < German silver

B. Bronze > Brass > German silver

C. Bronze < Brass < German silver

D. Bronze < Brass = German silver

Answer: B

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137. The salt which is least likely to be found in mineral is

A. Bromide

B. Sulphate

C. Oxide

D. Sulphides

Answer: B



138. During froth flotation process the student observed that the froth was disappeared after formation . The student added _____ to the container to overcome the difficulty .

A. Pine oil

B. Cresol

C. Benzene

D. NaCN

Answer: B



139. (1) Kaolinite is an ore of Al.

- (2) Sphalerite is an ore of sulphide of Cu.
- (3) Malachite is an oxide ore of copper
- (4) Sphalerite is an iron carbonate.

A. TETT

B. TTFT

C. TFFT

D. TFFF

Answer: C



140. (1) We metallurgical process is used for pyrites ores of lower grade.

(2) $2Cl^- + 2H_2O \rightarrow 2OH^- + H_2 + Cl_2$. The cell potential is -2.186 V. This reaction will take place in forward direction.

(3) Pure Zn metal is called spleter.

(4) The abundance of Al is highest. Its place is third and is about 9.3 % by weight.

A. TFFT

B. TTTT

C. FTFT

D. FFFT

Answer: A

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141. Calcination is the process of heating the ore

A. the presence of nitrogen

B. the absence of air

C. the presence of air

D. the presence of calciumcarbonate

Answer: B

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142. Azurite is an ore of

A. Aluminium

B. Zinc

C. Iron

D. Copper

Answer: D



143. which of the following electronts is present as the impurity to the maximum extent in the pig iron?

A. Carbon

B. Silicon

C. Phosphorus

D. Manganese

Answer: A



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144. Whch ore can be best concentrated by froth

flotation process ?

A. Calamine

B. Galena

C. Corundum

D. Cuprite

Answer: B



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

A. reduction with hydrogen

B. electrolytic method

C. reduction with aluminium

D. reduction with carbon

Answer: D



146. In the commercial electrochemical process for aluminium extraction, the electrolyte used is

A. molten mixture of Al_2O_3 and Na_3AlF_6

B. molten mixture of Al_2O_3 and $Al(OH)_3$

C. an alkaline solutio of Al_2O_3

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

Answer: A



147. Which of the following is a mineral of iron?

A. Malachite

B. Diaspore

C. Siderite

D. Azurite

Answer: C

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148. The metal extracted by leaching with cyanide is

A. Mg

B. Ag

C. Cu

D. Na

Answer: B

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149. For the reaction,

 $C+O_2
ightarrow CO_2, \Delta H=~-~393J$

 $2Zn+O_2
ightarrow 2ZnO, \Delta H= -412J$

Which one is correct ?

A. carbon can oxidise Zn

B. oxidation of carbon is not feasible

C. oxidation of Zn is not is not feasible

D. Zn can oxidise carbon

Answer: A

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

A. Magnetite

B. Malachite

C. Galena

D. Cassiterite

Answer: C

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151. 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 Zn



 $Ti(s)+2I_2(g) \stackrel{523K}{\longrightarrow} Til_4(g) \stackrel{1700K}{\longrightarrow} Ti(s)+2I_2(g)$

A. Zone refining

B. Cupellation

C. Poling

D. Van Arkel

Answer: D



153. In the aluminothermic proces, aluminium acts as

A. an oxidising agent

B. a flux

C. a reducing agent

D. a solder

Answer: C



154. Which of the following processes is used in the

extractive metallurgy of magnesium ?

A. fused salt electrolysis

B. Self reduction

C. Aqueous solution electrolysis

D. Thermite reduction

Answer: A



155. Which ore contains both iron and copper?

A. Cuprite

B. Chalcocite

C. Chalcopyrite

D. Malachite

Answer: C

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156. Electrolytic reduction of alumina to aluminium by

Hall-Heroult process is carried out:

A. in the presence of NaCl

- B. in the presence of fluorine
- C. in the presence of cryolite which forms at melt

with lower melting temperature

D. in the presence of cryolite which forms a melt

with higher melting temperature

Answer: C

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157. Pb and Sn are extracted from their chief ore by

A. carbon	reductior	n an	d self	reduction
respectively				
B. self	reduction	and	carbon	reduction
respectively				
C. electrolysis and self reduction respectively				

D. self reduction nad electrolysis respectively

Answer: B

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158. Which of the following is the chemical composition of diaspore ?

A. $Al_2O_3\cdot 2H_2O$

 $\mathsf{B.} Al_2O_3 \cdot H_2O$

 $\mathsf{C.}\,Al_2O_3$

D. Na_3 , AlF_6

Answer: B

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159. The chemical that initiates electrolysis in Halls

process is

A. Na_3AlF_6

 $\mathsf{B.}\,Al_2O_3$

 $\mathsf{C.} Al(OH)_3$

D. AlF_3

Answer: A

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160. The anion formed by aluminium with alkali is

A. Aluminide ion

B. Aluminate ion

C. Aluminous ion

D. Meta aluminate ion

Answer: D

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161. Which element can be present in anode mud?

A. Zn

B. Fe

C. Au

D. Ni

Answer: C



162. Which of the following is not an ore of copper?

A. Chalco pyrite

B. Ruby copper

C. Azurite

D. Pyrites

Answer: D

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163. What is the minium temperature of MgO by carbon ?

A. below 1600 K

B. above 1600 K

C. 1600 K

D. 1873 K

Answer: B



164. ELLINGHAM DIAGRAM

A.
$$2C+O_2
ightarrow 2CO$$

B. $C+O_2
ightarrow 2CO_2$
C. $rac{4}{3}Al+O_2
ightarrow rac{2}{3}Al_2O_3$
D. $4Ag+O_2
ightarrow Ag_2O$

Answer: A

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165. There is sudden change is the slopes for some metal oxides like MgO, ZnO , HgO in Ellingham diagram. It is the indication of

A. insufficient supply of oygen
B. excess of oxygen

C. phase change

D. completion of reaction

Answer: C

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166. Which thermodynamic property is significant in

study of Ellingham diagram?

A. Enthalpy

B. Entropy

C. Fugality

D. Gibb's energy

Answer: D

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167. The correct order of relative tendancy of the metal to undergo oxidation is

A. Mg > Cr > Hg > Ag

 $\mathrm{B.\,Mg} > \ \mathrm{Hg} \ > \ \mathrm{Cr} \ > \ \mathrm{Ag}$

 $\mathsf{C}.\,\mathsf{Mg} \ > \ \mathsf{Ag} \ > \ \mathsf{Cr} \ > \ \mathsf{Hg}$

 $\mathsf{D}.\,\mathsf{Mg} \ > \ \mathsf{Cr} \ > \ \mathsf{Ag} \ > \ \mathsf{Hg}$

Answer: A

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168. In the following Ellingham diagram X, Y and Z represents graph for metal oxides. Select correct option.



- A. Y will reduce oxide Z
- B. Y will reduce oxide X
- C. Z will reduce oxide X
- D. Z will reduce oxide Y

Answer: A

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169. In metallurgy , carbon is important reducing agent, because for the formation of CO_2

A. ΔS is positive

B. ΔG° is +400 KJ/mole

C. $\Delta G^{\,\circ}\,$ remains constant at all temperature

D. ΔH is +396 KJ/mole

Answer: C



170. HgO do not require reducing agent while isolation because

A. high + ve ΔG°

B. low $-ve\Delta G^\circ$

C. high-ve ΔG°

D. low $+ ve\Delta G^{\,\circ}$

Answer: B

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1. Willemite is

A. ZnO

B. $ZnCO_3$

 $\mathsf{C.}\,Zn_2SiO_4$

D. $Zn_2Fe_2O_3$

Answer: C

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2. Which of the following metals is obtained by leaching its ore with dilute cyanide solution ?

A. Silver

B. Titanium

C. Vanadium

D. Zinc

Answer: A

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3. Which one of the following is not a sulphide ore ?

A. Zincite

B. Chalcocite

C. Cuprite

D. Malachite

Answer: B



4. Whch ore can be best concentrated by froth

flotation process ?

A. Calamine

B. Galena

C. Corundum

D. Cuprite

Answer: B

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5. The principal reaction in the zone of fusion of blast

furnace employed in the metallurgy of iron is

A.
$$C + O_2 \rightarrow CO_2$$

 $\mathsf{B.}\,2C+O_2\to 2CO$

 $\mathsf{C.}\,CO_2 + C o CO$

D. $Fe_2O_3+3CO
ightarrow 2Fe+3CO_2$

Answer: A



6. The ore having two different metal atoms is

A. Copper pyrites

B. haematite

C. Magnetite

D. Calamine

Answer: A

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7. Calcination is the process of heating the ore

A. the presence of nitrogen

B. the absence of air

C. the presence of air

D. the presence of calciumcarbonate

Answer: B

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8. Azurite is an ore of

A. Aluminium

B. Zinc

C. Iron

D. Copper



9. which of the following electronts is present as the impurity to the maximum extent in the pig iron?

A. Carbon

B. Silicon

C. Phosphorus

D. Manganese

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Answer: A



10. Name the reagent that is used in leaching of gold .

A. Carbon

- B. Sodium cyanide
- C. Carbon monoxide
- D. lodine

Answer: B

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11. Which metal is refined by Mond's process?

A. Titanium

B. Copper

C. Nickel

D. Zinc

Answer: C

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

A. Haematite

B. Magnesite

C. Magnetic

D. Siderite

Answer: B

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13. Name the process that is employed to refine aluminium.

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Test Your Grasp

1. Iron is removed from cahalcopyrite as

A. FeS

- B. $FeSiO_3$
- $\mathsf{C}.\,FeO$
- D. Fe_2O_3

Answer: B

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2. Which of the following oxide cannot be reduced to

metal by carbon ?

A. ZnO

B. FeO

 $\mathsf{C.}\,Al_2O_3$

D. CuO

Answer: C

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3. Brine solution on electrolysis will not give.

A. O_2

 $\mathsf{B.}\,NaOH$

 $\mathsf{C}.\,H_2$

D. Cl_2

Answer: A

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4. Which of the following steps are involved in hydrometallurgical process ?

Α.

 $CuFeS_2+2H_2SO_4
ightarrow CuSO_4+FeSO_4+2H_2SO_4$

 $\texttt{B.} \ CuCO_3 + H_2SO_4 \rightarrow CuSO_4 + CO_2 + H_2O$

C. $CuSO_4 + 2Cu_2O
ightarrow 6Cu + SO_2$

D. $Cu_2 + 2Cu_2O
ightarrow 6Cu + SO_2$

Answer: D

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5. Which method is not correct for refining of crude metals ?

A. Zone refining : Silicon

B. Mond process: Aluminium

C. Electrolytic refining : Blister copper

D. Liquation : Tin

Answer: B

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6. Smelting involves reduction of metal oxide with

A. Aluminium

- B. Carbon monoxide
- C. Carbon
- D. Magnesium

Answer: C



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

A. The $\Delta G^{\,\circ}\,$ of the sulphide is greater than those

for CS_2 and H_2S

B. The ΔG° is negative for roasting of sulphide

ore to oxide.

C. Roasting of the sulphide to the oxide is thermodynamically feasible

D. Carbon and hydrogen are suitable reducing

agents for metal sulphides

Answer: D

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8. The principal reaction in the zone of heat absorption of blast furnace employed in the metallurgy of iron is

A. $2C + O_2 \rightarrow CO$

 $\texttt{B.}\ 2CO+O_2 \rightarrow 2CO_2$

 $\mathsf{C}.\ CaCO_3 \xrightarrow[-CO_2]{} CaO \xrightarrow[+SiO_2]{} CaSiO_3$

D. $C+O_2
ightarrow CO_2$

Answer: C

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9. Iron is mainly extracted by
A. self reduction method
B. carbon reduction method
C. electrolysis method
D. leaching with aqueous solution of NaOH
followed by reduction



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

A. in the presence of cryolite which forms a melt

with lower melting temperature

B. in the presence of cryolite which forms a melt

with higher melting point

- C. in the presence of KOH
- D. in the presence of NaCl



- C. Haematite
- D. Calamine

Answer: A



12. Which of the following statement is incorrect regarding the metallurgy of aluminium by electrolystic method ?

A. Electrolyte is Al_2O_3 dissolved in Na_2AlF_3

containing a little of CaF_2

B. Bauxite ore is purified before carrying out the

electrolysis

C. Aluminium being heavier than electrolyte floats

over the surface of the latter

D. Anode consist of a number of graphite rods

which are periodically replaced

Answer: C

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13. In the metallurgy of iron, the upper layer obtained

in the bottom of blast furnace mainly contains:

A. Slag

B. Pig iron

C. Cast iron

D. Wrought iron

Answer: B

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14. A mineral is known as an ore of metal if the metal

A. cannot be produced from it

B. can be produced from it

C. can be extracted from it profitably

D. is very costly

Answer: C
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15. Froth floatation process is used for the metallurgy
of
A. Oxide ore
B. Sulphide ore
C. Chloride ore
D. carbonate ore

Answer: B



16. (viii) Amongest the following groups of oxides, the group containing oxides that cannot be reducing by carbon to give the respective metals is.

A. PbO, Fe_3O_4

 $\mathsf{B.}\,Cu_2O,\,K_2O$

C. Fe_2O_3, ZnO

D. CaO, K_2O

Answer: D



17. In metallurgical processes the flux used for

removing acidic impurities is

A. Limestone

B. Sodium carbonate

C. Silica

D. Common salt

Answer: A



18. Roasting is done generally in case of

A. Silicate ore

B. Sulphide ore

C. Carbonate ore

D. Oxide ore

Answer: B

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19. The most common method of extraction of metals

from oxide ores involve

A. reduction with aluminium

B. reduction with hydrogen gas

C. reduction with coke

D. electrolytic method

Answer: C

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20. Froth floatation process for the concentration of sulphide ore is an illustration of the practical application of

A. Absorption

B. Adsorption

C. Sedimentation

D. Coagulation

Answer: B



21. Calcination is the process of heating the ore

A. in a blast furnace

B. in absence of air

C. in presence of air

D. in presence of calcium salt



22. Electrolytic reduction method is used fro the extraction of

A. highly electro positive elements

B. highly electro negative elements

C. transition metals

D. noble metals

Answer: A


23. The chemical formula of bauxite is

A. Al_2O_3

B. Al_2Cl_6

 $\mathsf{C.}\,Al_2O_3\cdot 2H_2O$

D. $Al_2CO_3 \cdot 4H_2O$

Answer: C

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24. In the aluminothermic proces , aluminium acts as

A. an oxidising agent

B. a reducing agent

C. a catalyst

D. a flux

Answer: B

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25. Which is not a mineral of aluminium

A. Diaspore

B. Bauxite

C. kaolinite

D. Siderite

Answer: D

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26. Which of the following contain carbonate ?

A. Magnetite

B. haematite

C. Siderite

D. Cuprite



C. graphite

D. Basic bricks

Answer: A



28. Which one of the following alloys has low density

but considerable strength ?

A. Brass

B. Bronze

C. Duralumin

D. Gun metal

Answer: C

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29. The alloy used for making permanent magnet is

A. Alnico

B. Invar

C. Magnalium

D. Chromsteel

Answer: A

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30. A compound used in the metallurgy of aluminium

to remove impruities is

A. Flux

B. basic flux

C. Acidic flux

D. Slag

Answer: B

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