CHEMISTRY

BOOKS - GRB CHEMISTRY (HINGLISH)

METALLUGY

Metallurgy

1. Calamine is an ore of

A. Zn

B. Mg

C. Ca

D. Pb

Answer: A

2. Which of the following ore contains both Fe and Cu?

    A. Chalcopyrite

    B. Malachite

    C. Cuprite

    D. Azurite

Answer: A

3. Which of the following is not an ore?

    A. Bauxite

    B. Corundum

C. Langbeinite

D. Argetite

Answer: C

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

A. Limonite

B. Cassiteite

C. Magnetite

D. None of these

Answer: B

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

    A. Malachite

    B. Calamine

    C. Salt cake

    D. Cerussite

Answer: C

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6. Which of the following set of elements mostly occur as sulphide ores.

    A. Zn,Cu,Mg

    B. Zn,Cu,Pb

    C. Fe,Al,Ti

    D. Cu,Ag,Au

Answer: B

7. The metal which is obtained from both sea- water and ores form the earth's solid crust is:

A. magnessium

B. iron

C. silver

D. gold

Answer: A

8. Which is not correct statements?

A. Cassiterite, chromite and haematite are concentrated by hardraulic wshing (Tabling).

B. Pure Al_2O_3 is obtained from the baruxite ore by leaching in the Bayer's proces.

C. Sulphide ore is concentrated by calcination method.

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

Answer: C

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9. Which material has beem named incorrectly

A. Bauxite : $Al_2O_3.2H_2O$

B. Corundum: Al_2O_3

C. Cryolite: $3NaF. AlF_3$

D. Feldspar:$Be_3Al_2Si_6O_{18}$

Answer: D

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10. Black tin is:

A. an alloy of Sn

B. an allotrope of Sn

C. 60-70% SnO_2

D. 100%SnO_2

Answer: C

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11. Chemical leaching is useful in the concentration of:

A. carnallite

B. bauxite

C. galena

D. zinc blende

Answer: B

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12. Sulphide ores are generally concentrated by the :

A. gravity separation process

B. calcination process

C. leaching process

D. None of these

Answer: D

13. Sometimes, it is possible to separate two sulphide ores by adjusting proportion of oil to water or by using depressants. In case of an ore containing ZnS and PbS, the depresent used is

A. $CuSO_4$

B. NaCN

C. Na_2S

D. None of these

Answer: B

14. Give the correct order of average oxidation state of Fe in the ores given: haematite (P). Magnetite (Q), siderite (R).
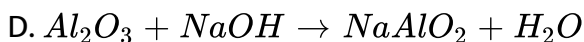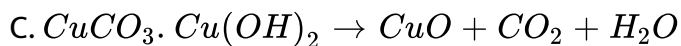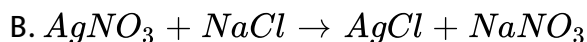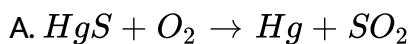
A. $P < Q < R$

B. $R < Q < P$

C. $R < P < Q$

D. $Q < P < R$

Answer: B

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15. which of the following reactions represents a calcinaiton reaction?

A. $HgS + O_2 \rightarrow Hg + SO_2$

B. $AgNO_3 + NaCl \rightarrow AgCl + NaNO_3$

C. $CuCO_3 . Cu(OH)_2 \rightarrow CuO + CO_2 + H_2O$

D. $Al_2O_3 + NaOH \rightarrow NaAlO_2 + H_2O$

Answer: C

16. The formula of carnallite is

A. $LiAl(Si_2O_5)_2$

B. $KCl. \ MgCl_2.6H_2O$

C. $K_2O. \ Al_2O_3.6SiO_2$

D. $KCl. \ MgCl_2.2H_2O$

Answer: B

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17. 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

18. The oxidation state of Cu and Fe in copper pyrities is respectively:

A. 1+and 2+

B. 2+and3+

C. 1+and3+

D. 1+and6+

Answer: A

19. Which of the following is a carbonate ore?

A. Pyrolusite

B. Malachite

C. Diaspore

D. Cassiterite

Answer: B

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20. Oxidation states of the metal in the minerals haematite and magnetite, respectively, are

A. II,III in haematite and II in magnetite

B. II,II in haematite and II in magnetite

C. II In haematite and II, III in magnetite

D. III in haematite and II, III in magnetitute

Answer: D

21. Magnetic separation process may be used for the concentration of:

A. Chalcopyrite

B. bauxite

C. haematite

D. calamine

Answer: C

22. Which pari of elements can form alloy?

A. Zn and Pb

B. Fe and Hg

C. Fe and Cr

D. C and Pt

Answer: C

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23. Which of the following does not contain Mg?
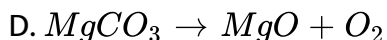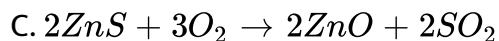
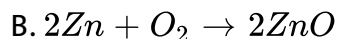A. Magnetite

B. Magnesite

C. Asbestos

D. Carnallite

Answer: A

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24. Which one of the following reactions is an example for calcination process

A. $2Ag + 2HCl + [O] \rightarrow 2AgCl + H_2O$

B. $2Zn + O_2 \rightarrow 2ZnO$

C. $2ZnS + 3O_2 \rightarrow 2ZnO + 2SO_2$

D. $MgCO_3 \rightarrow MgO + O_2$

Answer: D

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25. Which of the following metals is obtained by the self reduction process?
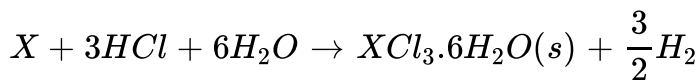
A. Copper

B. Iron

C. Silver

D. Magnesisum

Answer: A

Comprehension

1. An element (X) which is the most abundant metal in the earth's crust and the third most abudant element, is extracted by the electrolysis of its fused oxide in melted cryolite and fluorspar. XCl_3 exists as $(XCl_3)_n$ in crystalline state and is only dimeric (X_2Cl_6) in fused state

$$X + 3HCl + 6H_2O \rightarrow XCl_3.6H_2O(s) + \frac{3}{2}H_2$$

Anhydrous XCl_3 fumes in moist air and is very hygroscopic

When $XCl_3.6H_2O(s)$ is heated strongly, hte products formed are:

A. XCl_3 and H_2O

B. X_2O_3, HCl and $H)_2O$

C. $X(OH)_3$ and HCl

D. no effect

Answer: B

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Subjective type

1. For how many metals carbon reduction method is/are mainly applicable?

Sn,Al,Cr,Mn,Pb,Ca,Na,Zn

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Others

1. Bauxite is leached with:

    A. KCl

    B. NaCN

    C. NaOH

    D. Na_2SO_4

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 $Na\left[Zn(CN)_4\right]$

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

    D. they cannot be separated by adding NaCN

Answer: B

3. An ore of tin containing $FeCrO_4$ is concentrated by

    A. magnetic separation

    B. froth floatation

    C. leaching method

    D. gravity separation

Answer: A

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

    A. calcination

B. roasting

C. smelting

D. None of these

Answer: B

5. In roasting:

A. moisture is removed

B. non metal as their volatile oxide are removed

C. ore become porous

D. all of the above

Answer: D

6. Roasting is carried out in case of:

    A. galena

    B. iron pyrites

    C. copper galena

    D. all of the above

Answer: D

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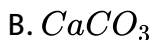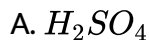**7.** Which of the following is not an ore:

    A. Malachite Calamine

    B. Calamine

    C. Stellite

    D. Cerussite

Answer: C

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8. 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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9. For low grade copper ore we use:

A. hydro metallurgy

B. pyro metallurgy

C. electro metallurgy

D. None of these

Answer: A

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10. Which of the following is not an ore of iron?

A. Magnetite

B. Haematite

C. Siderite

D. Chalcopyrite

Answer: D

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11. Hydraulic washing/gravity separation can be used to concentrate:

A. Ore of Na

B. Ore of K

C. Carmalite

D. Ore of Fe

Answer: D

12. Froth floatation process isused to concentrate:

A. sulphide ores

B. oxide ores

C. halide ores

D. elemental ores

Answer: A

13. Which of the following statemetnt is not correct for leaching?

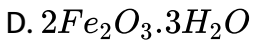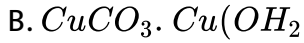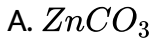A. Ore shoule be soluble in a suitable solvent

B. It is done for low grade ores.

C. Leaching of Al_2O_3 from bauxite is based on amphoteric nature of

bauxite.

D. None of these

Answer: D

14. Calcination cannot be done In case of

   A. $ZnCO_3$

   B. $CuCO_3. Cu(OH_2$

   C. PbS

   D. $2Fe_2O_3.3H_2O$

Answer: C

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15. Among the following statements, the incorrect one is

   A. calamine and siderite are carbonate ores

   B. argentite and curprite are oxide ores
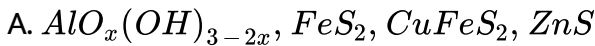
   C. zinc blende and pyrites are sulphide ores

   D. malachite and azrites are ores of cupper

Answer: B

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16. Which one set of minerals is best suited for roasting?

A. $AlO_x(OH)_{3-2x}$, FeS_2, $CuFeS_2$, ZnS

B.

$K_2SO_4 \cdot Al_2(SO_4)_3 \cdot 24H_2O$, $CuCO_3 \cdot Cu(OH)_2$, Cu_2S, PbS, Fe_2O_3

C. $CuFeS_2$, HgS, ZnS, PbS, Fe_2O_3

D. $AgCl$, $Al_2(OH)_4Si_2O_5$, Cr_2O_3, ZnO

Answer: C

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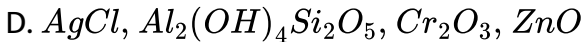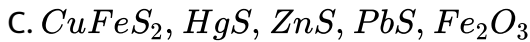
17. Which is incorrect for function of flux?

A. Lowers down the temperature of melting of ore

B. Remove gangue

C. Remove particles

D. As solvent

Answer: D

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18. In froth floatation process for PbS (Galenea) contains ZnS and Fes impurity the depressant we use is:

A. NaCn

B. Sodium ethylexenthate

C. Pine oil

D. $CuSO_4$

Answer: A

19. Which of the following is used as a froth stabilizer?

A. Pine oil

B. $CuSO_4$

C. $C_2H_5 - O - \underset{\underset{S}{||}}{C} - S^- / Na^+$

D. Aniline

Answer: D

20. Select the correct staetment:

A. Magnetite is an ore of maganese

B. Pyrolusite is an ore of lead

C. Siderite is carbonate ore of iron

D. $FeSO_2$ is rolled gold

Answer: C

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21. Electromagneitc separation is used for:

A. When ore is non-magnetic and impurity is magnetic

B. When ore is magnetic and impurity is non-magnetic

C. Both a and b

D. None of these

Answer: C

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22. Among the following statements, the incorrect one is

    A. calamine and siderite are carbonate

    B. argentite and curprite are oxide

    C. zinc blende and pyrites are sulphide

    D. malachite and azrites are ores of copper

Answer: B

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23. 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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24. The metal that occurs in the nativ estae as well as in the combined form is

    A. silver

    B. magnesium

    C. aluminium

    D. manganese

Answer: A

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25. Element found in the sediments in the ocean floor is:

A. iron

B. magnesium

C. gold

D. iodine

Answer: B

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26. 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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27. "Fool's gold" is:

A. iron pyrities

B. horn silver

C. copper pyrites

D. bronze

Answer: A

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

A. levigation

B. liquation

C. copper pyrites

D. bronze

Answer: A

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29. Gravity separation method is based upon:

A. preferential washing of ores and gangue particles

B. difference in chemical properties of ore particles and impurities

C.

D. None of these

Answer: B

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

A. they are light

B. they are insoluble

C. their suface is preferentially wetted by oil

D. they bear an electrolytic charge

Answer: C

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31. Gravity separation process may be used for the concentration of:

A. Chalcopyrite

B. bauxite

C. haematite

D. calamine

Answer: C

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32. Wolframite is separated from cassiterite by:

A. froth floatation method

B. levigation

C. electromagnetic separation method

D. electrostatic separtation method

Answer: C

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33. Froth flotation process used for the concentration of sulphide ore.

A. is based on the difference in wetablity of different minerals

B. used xanthates and fatty acids as collectors.

C. uses NaCN as depressant in the mixtures of ZnS and PbS when

ZnS soluble complex and PbS forms froth.

D. all are correct statements

Answer: D

34. Haematite ore is conentrated by:

A. gravity separation process

B. froth floatation

C. amalgamation

D. leaching

Answer: A

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35. The most common elements present in the crust of the Earth are:

    A. oxygen, silicon, aluminium

    B. oxygen,iron,magnesium

    C. silicon,iron,potassium

    D. oxygen,iron,silicon

Answer: A

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

A. adsorption

B. absorption

C. sedimentation

D. cagulation

Answer: A

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37. In Froth floatation process for, pine oil functions oil functions as:

A. activator

B. frother

C. collector

D. agitator

Answer: B

38. Find the incorrect match

A. Azuite:$CuCO_3.2Cu(OH)_2$

B. Malachite:$Cu(OH)_2.\,CuCO_3$

C. Anglesite: $PbSO_4$

D. Chalcocite:Cu_2S

Answer: A

39. The substance not likely to contain $CaCO_3$ is

A. sea shells

B. dolomite

C. marble statue

D. calcined gypsum

Answer: D

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40. Collectors are the subsances which help in attachment of an ore particle to air bubble in froth. A popular collector used industrically is:

A. sodium ethyl xanthe

B. sodium xenate

C. sodium prophosphate

D. sodium nitroprusside

Answer: A

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41. A non magnetic ore contaning the impurity of $FeCr_2O_4$ is concentrated by:

    A. magnetic separation

    B. gravity separation

    C. froth floatation method

    D. electrostatic method

Answer: A

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

    A. they are light

    B. they are insoluble

C. they are charged

D. they are hydrophobic

Answer: D

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43. 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. hydro metallurgy

B. electrometallurgy

C. zone reffing

D. electrofinning

Answer: A

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44. 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. P,Q and R only

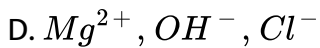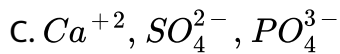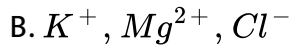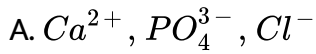   B. P,Q and S only

    C. P,R and S only

    D. P,Q,R and S

Answer: C

45. "Chlorapatite" is an important mineral of eleventh most abudant element of earth's crust.

A. Ca^{2+}, PO_4^{3-}, Cl^-

B. K^+, Mg^{2+}, Cl^-

C. $Ca^{+2}, SO_4^{2-}, PO_4^{3-}$

D. Mg^{2+}, OH^-, Cl^-

Answer: A

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46. Oxidation of ore involved in:

A. calcination of calamine

B. heating of haematite with aluminum

C. roasting of galena
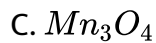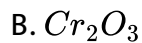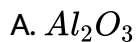
D. None of these

Answer: C

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47. Many gemstone are impure from of:

A. Al_2O_3

B. Cr_2O_3

C. Mn_3O_4

D. None of these

Answer: A

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48. Roasting process is used for:

A. impure of Fe_2O_3
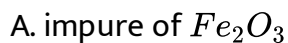
B. $CuFeS_2$

C. ZnS

D. all of these

Answer: D

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49. The benefication of the sulphide ores is usually done by:
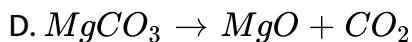
A. electrolysis

B. smelting process

C. metal dispalacement method

D. Froth floatation method

Answer: D

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50. Which one of thte following reaction is an example for calcination process?

A. $2Ag + 2HCl + (O) \rightarrow 2AgCl + H_2O$

B. $2Zn + O_2 \rightarrow 2ZnO$

C. $2ZnS + 3O_2 \rightarrow 2ZnO + 2SO_2$

D. $MgCO_3 \rightarrow MgO + CO_2$
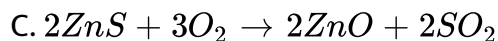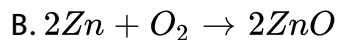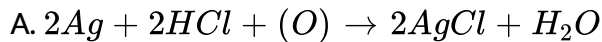
Answer: D

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51. In the isolatin of metals, calcination process usually results in:

A. metal oxide

B. metal carbonate

C. metal hydrooxide

D. metal sulphide

52. We have two minerals of one metal, frst is sulphide and second is oxide. Then find the correct staement regarding extraction of metal from these two minerals.

    A. Sulphide mineral is good choice for extraction of metal

    B. Oxide mineral is good choice for extraction of metal

    C. Any of these two may be ore, depends on the concentration of the metal in the minerals, durability of the process and other relevant factors

    D. Always sulphide mineral will be the ore

Answer: C

53. Which one of the following statements is false?

    A. During roasting, moisture is removed from the ore

    B. The ore becomes free form almost all organic impurities

    C. Calcination or ore is carrid out in absence of any blast of air

    D. The concentrated zinc blende is subjected to calcination during its extraction by pyrometallurgy

Answer: D

54. Zinc blende ore on roasting at above $850°C$ gives:

    A. ZnS and $ZnSO_4$

B. CO_2 and ZnO

C. SO_2 and ZnO

D. Zn and SO_2

Answer: C

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55. Which is not correct statements?

A. Casseterite and chromite is concentrated by magnetic separation method.

B. Pure Al_2O_3 is obtained from the baruxite ore by leaching in the Bayer's proces.

C. Sulphide ore is concentrated by calcination method.

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

Answer: C

56. Which ore is having maximum percentage of 'Cu' by weight?

A. Copper pyrites

B. Copper glance

C. Cuprite

D. Malachite

Answer: C

57. Which of the following ore is converted into oxide by roasti but not by calcination?

A. Chalcocite

B. Cerrusite

C. Anglesite

D. Dolomite

Answer: A

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58. Select the ore in which corresponding metal is represent to highest

ooxidation state among the given ores.

A. Copper pyrites

B. Zincite

C. haematite

D. Pyrolusite

Answer: D

59. Which elemetn I sobtained commerically foem seawater?gt

   A. Bromine

   B. Gold

   C. Iron

   D. Oxygen

Answer: A

60. Bronze is an alloy of:

   A. copper and tin

   B. copper and zin

C. nickel and tin

D. nikel and zinc

Answer: A

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61. Manetite, which has the formula Fe_2O_3 is comprised or iron(II) oxide and iron (III) oxide. What is the ratio of iron(II) ions to iron(III) ions in magnetiude.

A. $1:1$

B. $1:2$

C. $2:3$

D. $3:2$

Answer: B

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62. Which one of the following ore is not the ore iof Cu?

A. Chalcopyrite

B. Chalcocite

C. Pyrolusite

D. Cuprite

Answer: C

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63. In banxite $AlO_x(OH)_{3-2x}$ the value of x is:

A. $0 < x < 1$

B. $1 < x < O$

C. X=0

D. X=1

Answer: A

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64. From 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 paritcles

Answer: C

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65. 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. hydro metallurgy

B. electrometallurgy

C. zone reffing

D. electrorefining

Answer: A

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66. Ore dressing for iron is done by

A. froth floatation method

B. magnetic separation

C. hand picking

D. all of the above

Answer: B

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67. Which of the following mineral does not contain iron?

A. Copper pyrite

B. Iron pyrite

C. ilmenite

D. Tincal

Answer: D

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68. The correct statemetn is:

A. dolomite is the ore of zinc

B. galena is an ore of mercury

C. pyrolusite is an ore of iron

D. cassiterite is an ore of tin

Answer: D

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69. Leaching is a process of

A. reduction

B. concentration

C. refining

D. oxidation

Answer: B

---

70. The purpose of roasting an ore is:

A. to convert oxide ore to sulphide ore

B. to reduce it

C. to separate S, As, Sb impurities

D. to obtain an alloy

Answer: C

---

71. Smithsonite is American name of....ore (European name). Metal is extracted from Smithsonite by calcination followed by carbon reduction, Europeach name of Smithsonite is:

A. Calamine

B. bauxite

C. dolomite

D. sphalerite

Answer: A

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

A. adsorption

B. absorption

C. coagulation

D. sedimentation

Answer: A

73. When roasting is carried out:

(P) sulphde ore sare converted into oxide and suphate

(Q) Remove water of hydration

(R) Melt the ore

(S) Remove arsenic and sulphur impurities

A. P, Q and R are correct

B. P and S are correct

C. P, Q and S are correct

D. Q, R and S are correct

Answer: C

74. Which one of the following ores is the best concentrated by froth floatation method?

A. Malachite

B. Magnetite

C. Siderite

D. Galena

Answer: D

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75. Selection of temperature to carry out a reducction process depends so as to make:

A. ΔG negative

B. ΔG positive

C. ΔH negative

D. ΔH positive

Answer: A

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76. Select the correct statement.

A. In the decomposition of an oxide into oxygen and solid/liquid

metal, entropy increases.

B. Decompostion 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 are correct statements

Answer: D

77. 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. CO_2 is thermodynamically more stable than CS_2

    B. Metal sulphide are less stable than the corresponding oxides

    C. CO_2 is more volatile than CS_2

    D. Metal sulphide are thermodynamically more stable than CS_2

Answer: C

78. Carbon cannot be used in the reduction of Al_2O_3 because:

    A. it is non metal

B. the heat of formation of CO_2 is more than that of Al_2O_3.

C. pure carbon is not easily available

D. that heat of formation of Al_2O_3 is too high

Answer: D

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79. Electrolytic reduction method is used fro the extraction of

A. high electronegative elements

B. highly electropositive elements

C. transition metals

D. noble metals

Answer: B

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

    A. Pb

    B. Fe

    C. Zn

    D. Al

Answer: D

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81. 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. Al,Ag

Answer: B

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

A. Cu_2O, SnO_2

B. Fe_2O_3, ZnO

C. CuO, K_2O

D. PbO, FeO

Answer: C

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83. 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. electrometallurgy

    B. hydrometallurgy

    C. electro-refinning

    D. zone refining

Answer: B

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84. (viii) Amongest the following groups of oxides, the group containing oxides that cannot be reducing by carbon to give the respective metals is.
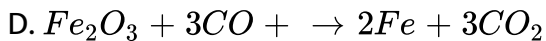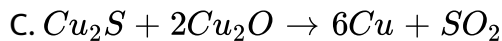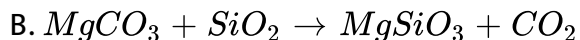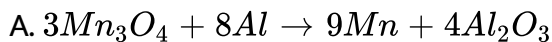
A. CaO and K_2O

B. Fe_2O_3, ZnO

C. Cu_2O and SnO_2

D. $PbO,$ and Pb_3O_4

Answer: A

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85. Which of the following represents the thermite reaction ?

A. $3Mn_3O_4 + 8Al \rightarrow 9Mn + 4Al_2O_3$

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

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

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

Answer: A

86. In metallurgy process, the flux used for removing acidic impurities is:

A. silica

B. sodium chloride

C. lime stone

D. sodium carbonate

Answer: C

87. Which of the following metals can be extracted by both self-reduction and cabon reduction methods?

A. Fe

B. Al

C. Pb

D. Ag

Answer: C

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88. An ore after levigation is found to have acidic impurities. When of the following can be used as flux during smelting operation ?
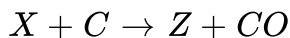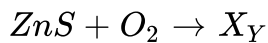
A. H_2SO_4

B. $CaCO_3$

C. SiO_2

D. Both CaO and SiO_2

Answer: B

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89. The chemical reaction involved in roasting process:
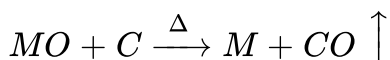
$$ZnS + O_2 \rightarrow X_Y$$
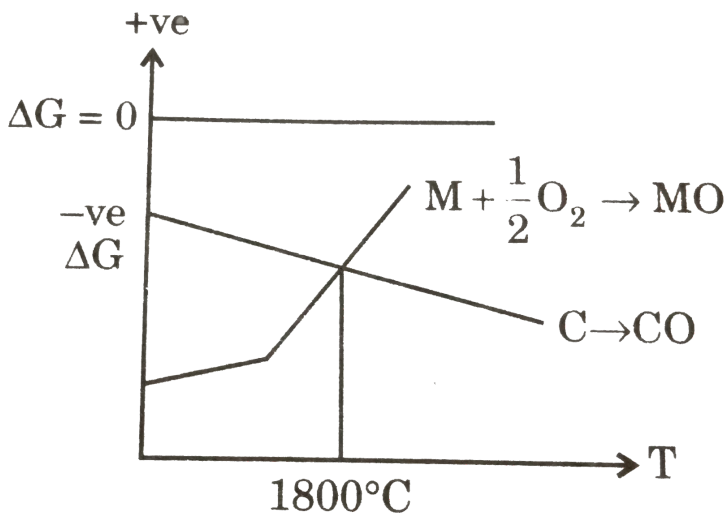
$$X + C \rightarrow Z + CO$$

Choose the correct statement

A. Compound X is amphoteric in nautre.

B. X can be reduced by self reducton method.

C. Y having $p\pi - p\pi$ as well as $p\pi - d\pi$ bond.

D. Y is polar as well as planer molecule.

Answer: A,C,D

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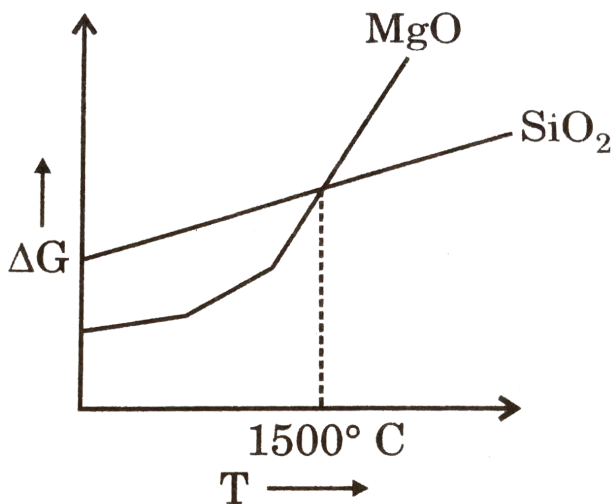**90.** In the following chemical reaction:

$$MO + C \xrightarrow{\Delta} M + CO \uparrow$$

ΔG overall of the reaction is zero at what temperature

A. $1800°\,C$

B. More than $1800°\,C$

C. Less then $1800°\,C$

D. None of these

Answer: A

91. For this graph which option is correct?

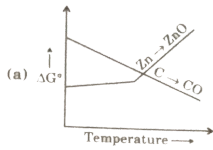A. At less than $1500^\circ C$, Mg acts as reducing agent for SiO_2

B. At more than $1500^\circ C$, Si acts as reducing agaent for MgO
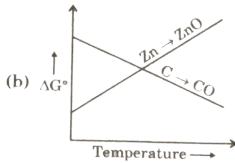
C. Both a and b

D. None of these

Answer: C

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92. If metallic zinc is collected in the form of vapour by the carbon reduction process, the correct diagram would be represent as:

A.

B.
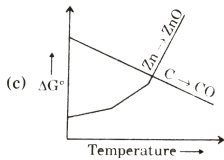
C.

D.
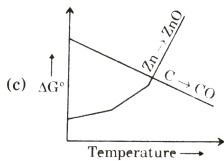
Answer: C

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93. Which of the following plots between ΔG° and $T(^\circ C)$ represents the sequence of oxide of formation of a metal in its different phase as given below? Assume the metallic oxide is thermally stable in different stages

$$M(s) + O_2(g) \xrightarrow{\ I\ } MO_2(s)$$

$$M(l) + O_2(g) \xrightarrow{\ II\ } MO_2(s)$$

$$M(g) + O_2(g) \xrightarrow{\ III\ } MO_2(s)$$

(a)

A.

(b)

B.

(c)

C.
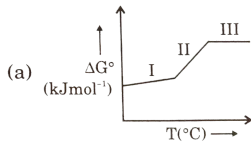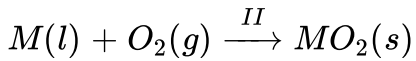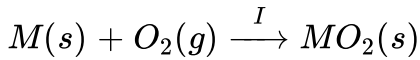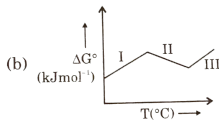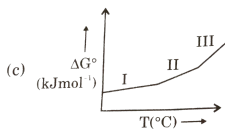
(c)
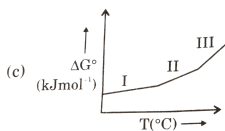
D.

Answer: C

94. Which is correct representation for the following chemical reaction?

A.

(a) ΔG — graph with horizontal line labeled Pb→PbO, axis T

B.

(b) ΔG — graph with rising line labeled Pb→PbO, axis T

C.

ΔG — graph with descending line labeled Pb→PbO, axis T

D.

ΔG — graph with descending line labeled Pb→PbO, axis T
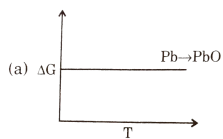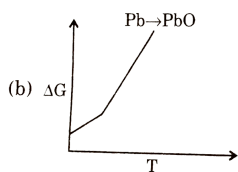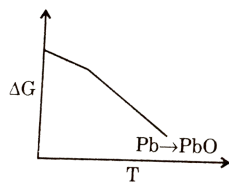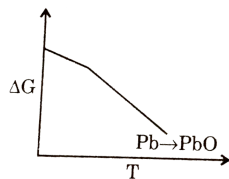
Answer: B

95. The standard free energy of formation of MgO AND CO at temperature $1000°C$ and $2000°C$ are given below (they refer to the reaction involving one mole of oxygen at one atomsphere pressure) The free energy change to the reaction.

$$2Mg + O_2 \rightarrow 2MgO \qquad \Delta G_{1000°C} = -941 kJ/mol$$

$$\Delta G_{2000°C} = -341 kJ/mol$$

$$2C + O_2 \rightarrow 2CO \qquad \Delta G_{1000°C} = -439 kJ/mol$$

$$\Delta G_{2000°C} = -628 kJ/mol$$

A. At $1000°C$ temperature

B. At $2000°C$ temperature

C. Both a and b

D. None of these

Answer: B

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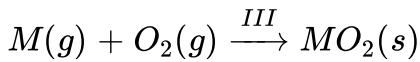**96.** Which of the following is better reducing agent at 673K in pyrometallurgy?

A. C

B. CO_2

C. CO

D. None of these

Answer: C

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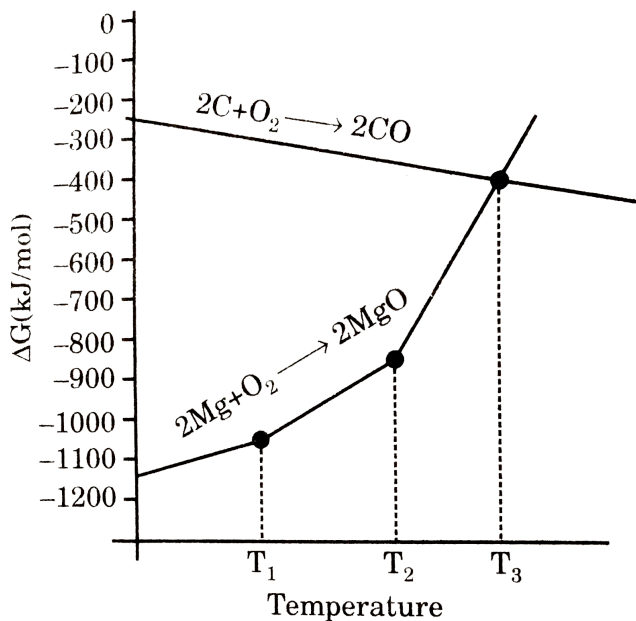
97.

Incorrect statement about the plot is/are:

A. T_1 and T_2 are melting point and boiling point of Mg repectively.

B. T_1 and T_2 are melting point and boiling point of MgO repectively.

C. Reducing of MgO by coke is possibe above T_3.

D. Mg can be extracted from gaseous products by rapid cooling.

Answer: B

98. 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

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

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

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

C. the Gibb's free energy of formation of most sulphides are greater

than that for CS_2

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

Answer: C

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100. Ellingham diagram can be drawn for the following:

A. Sulphides

B. Oxides

C. Halides

D. All of these

Answer: D

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101. Select the correct staement for the conversion of

$$MO(s) \rightarrow M(g) + \frac{1}{2}O_2(g)$$
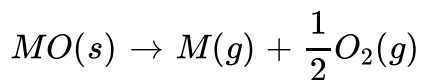
A. Entropy increases

B. It is an endothermic change

C. To make $\Delta G°$ negative, temperature should be high enough so

that $T\Delta S° > \Delta H°$.

D. all are correct statements

Answer: D

102. Carbon reduction is not possible for the oxide of alkaline earth

metals because:

A. of formation of carbides at high temperatures

B. high temperature is not required for reduction

C. carbon reduction is not possible for any alkaline earth metals except Be

D. None of these

Answer: A

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103. Which of the following statemetnt is incorrect regarding Ellingham diagram for a metal ?

A. In general, on increasing temperature free energy change also increses

B. Graph for which ΔS is negative, will have positive slope

C. Graph for which ΔS is negative, will have negative slope

D. None of these

Answer: C

104. 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

105. From the Ellingham graphs of cabron, which of the following staement is false?

A. CO_2 is more stable than CO at less than 983K

B. CO reduces Fe_2O_3 to Fe at less than 983K

C. CO is less stable than CO_2 at more than 983K

D. CO reduces Fe_2O_3 to Fe in the reduction zone of blast furnace

Answer: C

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106. Which of the following metal oxide is more stable if the free of formation of Cr_2O_3 and Al_2O_3per mole of oxygen consumed are $-540Kj$ and $-827kJ$ respectively?

A. Cr_2O_3

B. Al_2O_3

C. Both have equal stablility

D. None of these

Answer: B

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107. Cabon cannot reduce Fe_2O_3 to Fe at a temperature below 983K because.

    A. free energy change the formation of CO is more negative than that Fe_2O_3

    B. CO is thermodynamically more stable than Fe_2O_3

    C. carbon has higher affinity towards oxygen than iron

    D. iron has higher affinity towards oxygen than carbon

Answer: D

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108. $\Delta G^{\ominus}$ vs T plot in Ellingham diagram slopes downward for the reaction .

A. $Mg + \dfrac{1}{2}O_2 \to MgO$

B. $2Ag + \dfrac{1}{2}O_2 \to Ag_2O$

C. $C + \dfrac{1}{2}O_2 \to CO$

D. $CO + \dfrac{1}{2}O_2 \to CO_2$
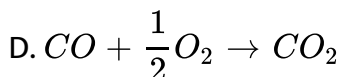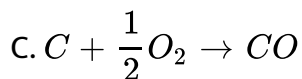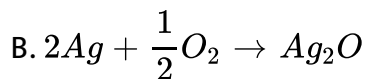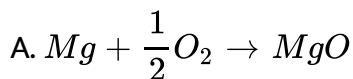
Answer: C

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109. Consider the following reaction at $1000°C$

$(A)Zn_{(s)} + \dfrac{1}{2}O_{2(s)} + ZnO_s, \Delta G^0 = -360kJ\text{mole}^{-1}$

$(B)\,(B)Cn_{(s)} + \dfrac{1}{2}O_{2(g)} \to CO_s, \Delta G^0 = -460kJ\text{mole}^{-1}$
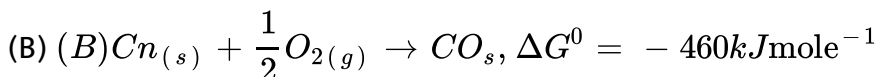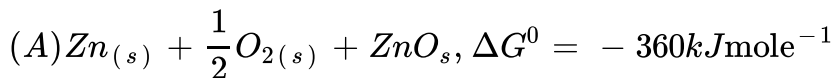
choose the correct statement at $1000^0 C$

A. Zinc can be oxidised by CO

B. Zinc oxide can be reduced by C

C. Both satement (a) and (b) are true

D. Both statement (a) and (b) are false

Answer: B

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110. $Acl_2(excess) + BCl_2 \rightarrow Acl_4 + B \downarrow$
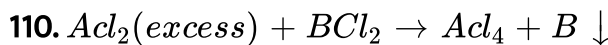
$BO \xrightarrow[>400°C]{\Delta} \frac{1}{2}O_2 + B_2.$ If A and B metal then ore of B would be:

A. siderite

B. cinnabar

C. malachite

D. horn silver

Answer: B

111. In pyro metallurgy the metals are extracted from ores and concentrates by heat treatment. This involves conversion to metal oxide. This is followed by the reduction of the oxide to the metal using carbon or carbon monoxide.

$4Cr(s) + 3O_2(g) \rightarrow 4Cr_2O_3(s),$

$$\Delta G° = 1500kJ/\text{mol at} 1200°C$$

$2Mn(s) + O_2(g) \rightarrow 2MnO(s),$
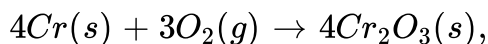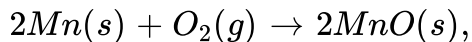
$$\Delta G° = -600kJ/\text{mol at} 1200°C$$

$2C(s) + O_2(g) \rightarrow 2CO(g),$
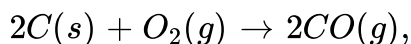
$$\Delta G° = -550kJ/\text{mol at} 1200°C$$

A. C(s) can reduce MnO(s) under given condition

B. C(s) can reduce Cr_(2)O_(3)(s) under given condition0

C. Neither MnO(s) nor $Cr_2O_3(s)$ be reduced by C(s) under given condition

D. Both will be reduced simultaneously if carbon is passed over a

mixture $MnO(s)$ and $Cr_2O_3(s)$.

Answer: B

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112. Select the statement which is correct?

A. In Ellingham diagram $M \rightarrow MO$ curves are having negative

slope.

B. MgO can be reduced by carbon at very high temperature

$(\approx 1800°C)$

C. In blast furnace, carbon not reduce iron oxides

D. Extraction of metals are based upon oxidation

Answer: B

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

A. Carbon reduction

B. carbon monoxide reduction

C. aluminothermite process

D. electrolytic reduction

Answer: C

114. By which process Pba and Sn are extracted respectively are:

A. Carbon reduction and self reduction

B. self reduction and Carbon reduction

C. electrolytic reduction and cynanide process

D. cynanide process and electrolytic reduction

Answer: B

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115. In which of the following isolations no reducing agent is requiredgt

A. Iron from haematite

B. Tin from cassiterite

C. Mercury from cinnabar

D. Zinc from zinc blende

Answer: C

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116. A metal has a high concentration into the earth crust and whose oxides cannot be reducted by carbon. The most suitable method for the extraction of such metal is:

A. aluminothermite process

B. electrolysis process

C. van-Arkel's process

D. cupellation

Answer: B

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117. Copper is extracted by hydrometallurgy from low grade ores. Which of the following reaction is/are involvedgt

A. $Cu^{2+}(aq) + H_2(g) \rightarrow Cu(s) + 2H^+(aq)$

B. $Cu^{2+}(aq) + Fe(s) \rightarrow Cu(s) + Fe^{2+}(aq)$

C. $Cu_2S + 2Cu_2O \xrightarrow{\Delta} 6Cu + SO_2$
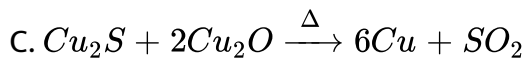
D. Both a and b

Answer: D

118. Which of the following metals is extracted by self reduction method from its sulphade ore?

A. Fe

B. Cu

C. Mg

D. Sn

Answer: B

119. Extraction of zinc from zinc blende is achived by:

    A. electrolytic redcution

    B. roasting followed by reduction with cabon

    C. roasting followed by reduction with another metal

    D. roasting followed by self-reduction

Answer: B

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120. 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

---

121. 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

---

122. In Goldschmidt aluminothermic process, thermite mixture contains:

A. $3\,parts\,Fe_2O_3$ and $2\,parts\,Al$

B. $3\,parts\,Al_2O_3$ and $2\,parts\,Al$

C. $1\,parts\,Fe_2O_3$ and $12\,parts\,Al$

D. $3\,parts\,Fe_2O_3$ and $1\,parts\,Al$

Answer: D

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123. On heating a mixture of Cu_2O and Cu_2S, we get :

A. $Cu + SO_2$

B. $Cu + SO_3$

C. $CuO + CuS$

D. Cu_2SO_3

Answer: A

124. The reactions which is not involved in the extraction of iron from the mixture from the mixture of its ores:

$(Fe_2O_3 + Fe_2O_3.3H_2O + FeO_3 + Fe_3O_4)$

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

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

C. $SiO_2 + C \rightarrow Si + CO_2$

D. $CaO + SiO_2 \rightarrow CaSiO_3$
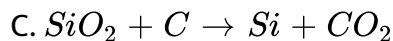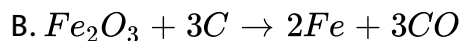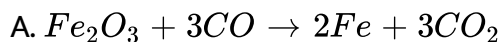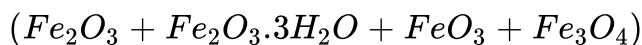
Answer: C

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125. The iron obtained from the blast furnace is called:

A. pig iron

B. cast iron

C. wrought iron

D. steel

Answer: A

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126. Which one of the following reactions occur during smelting in the reduction zone at lower temperature(in iron metallurgy)?

A. $CaO + SiO_2 \rightarrow CaSiO_3(\text{slag})$

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

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

D. $CO_2 + C \rightarrow 2CO$
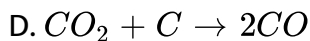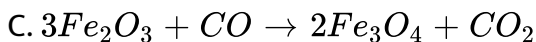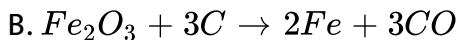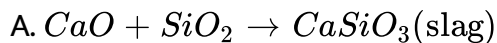
Answer: C

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127. Slag is a product of:

    A. flux and coke

    B. coke and metal oxide

    C. flux anad impurities

    D. metal and flux

Answer: C

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128. Self reduction is not applied for the extraction of:

    A. Cu

    B. Pb

    C. Hg

D. Al

Answer: D

129. Bessemerisationis carried out for:

(P) Fe, (Q) Cu,

(R)Al, (S) Ag

A. P,Q

B. Q,R

C. R,S

D. P,R

Answer: A

130. Which of the following reaction is not involved in roasting?

A. $2PbS + 3O_2 \rightarrow 2PbO + 2SO_2$

B. $PbS + 2O_2 \rightarrow Pb2SO_4$

C. $4Fe_3O_4 + 5O_2 \rightarrow 2Cu_2O + 4SO_2$

D. $4CuS + 5O_2 \rightarrow 2Cu_2O + 4SO_2$
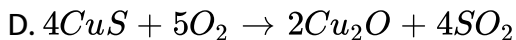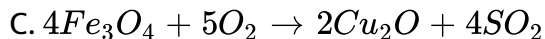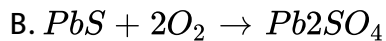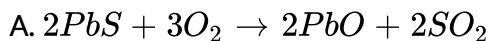
Answer: C

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131. Which of the following reactions is/are involved in the extraction of Cy from any ore of copper?

A. $Cu_2O + C \xrightarrow{\Delta} 2Cu + CO$

B. $CuSO_4 + Fe \rightarrow Cu + SO_2$

C. $2CuSO_4 + Cu_2S \rightarrow 6Cu + SO_2$
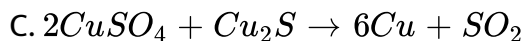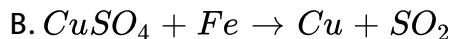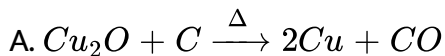
D. All of the above

Answer: D

132. Select the correct statement regarding extraction of iron from mixture of its oxide and carbonate ores.

   A. Roasted mixture of ores mainly contain FeO.

   B. Most of iron is obtianed by reduction of its oxide by CO gas at

     very high temperature of $1800°\,C$

   C. Reduction of Fe_2O_3 into Fe follows the sequence

     $Fe_2O_3 \rightarrow Fe_3O_4 \rightarrow FeO \rightarrow Fe$
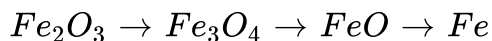
   D. Coke powder is the reducing agent at lower temperature range

     $(300 - 800°\,C)$

Answer: C

133. Which of the following reaction is/are involved in the extraction of

Pb from PbS?

A. $PbS + 2PbO \rightarrow 3Pb + SO_2$

B. $PbSO_4 + 2PbS \rightarrow 2PbO + 2SO_2$

C. $2PbS + 3O_2 \rightarrow 2PbO + 2SO_2$
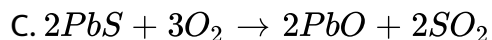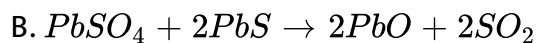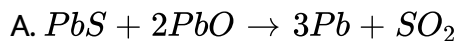
D. All of these
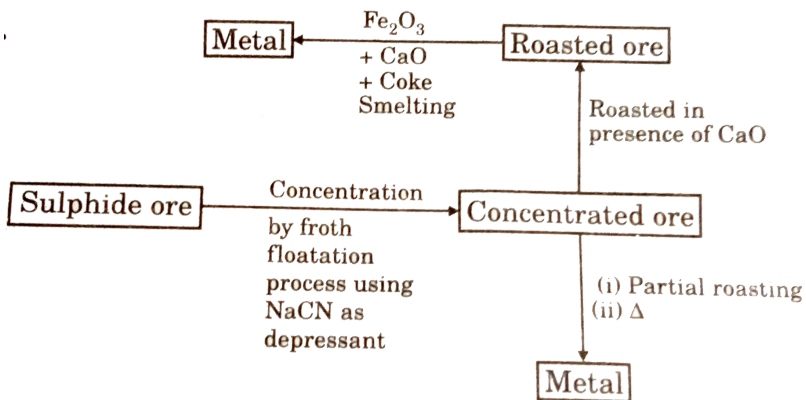
Answer: D

134.

The given outline depicts the extraction of:

A. Ag from Ag_2S

B. Zn from ZnS

C. Pb from PbS

D. Cu from $CuFeS_2$

Answer: C

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135. Consider the following statement: Statement-1: In extraction of iron from haematite ore, the reduction reactions take place only in the lower temperature range in the blast furnace.

Statement-2:Calamine is an carbonate ore of zinc. ltbr Statement-3: The principle opre of aluminium, bauxite, usually contains silica, iron oxides and titanium, oxide as impurities.

Statement-4:Solidified copper obtained from silica lined convertor (Bessemer converter) has blistered appearance due to the evolution of SO_2 and arrange in the order of true/false.

A. FTTT

B. FTFF

C. FFTT

D. TFFT

Answer: A

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136. Consider the following statement:

Statement-1:In electrolytic refining, the impurities from th blister copper deposits anode mud which contains antinomy, selenium, telluriun, silver, gold and plantinum. (From copper pyrites)

Stament-2: In Serpeck's process, silica is removed by heating the bauxite to $1800°C$ with coke in a current of N_2.

Statement-3:Chalcocite and azurite are ores of copper.

Statement-4:The tin is obatined by the carbon redcution of black tin. and arrange in hte order of true/false.

    A. TFTT

    B. FTFF

    C. FFTT

    D. TTTT

Answer: D

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137. Consider the following statement:

Statement-1: Extraction of zinc from sphalerite involves roasting followed by carbon redcution.

Statement-2:In bessemer convertor, along with copper $FeSiO_3$ is also obtained.

Statement-3: In extraction of lead, CaO prevents formation of $PbSiO_3$.

Statement-4:Copper is extracted by hydrogen metallurgy from low grade ores and scraps.

and arrange in the order of true/false.

   A. TTTF

   B. FTTF

   C. TTTT

   D. FFFT

Answer: C

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138. Blister copper is:

    A. impure copper

    B. obtained in self reduction process during bessemerisation

    C. both a and b are correct

    D. None of these

Answer: C

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139. Select the correct option for the given processes.

(P) Process of heating stell to redness and then cooling it very slowly.

(Q) Process of heating steel in presence of NH_3 and producing hard coasting of iron nitrate on the surface of steel.

(R) Process of heating steel to redness and then cooling it suddenly by plunging it into water or oil.

(S) Process of heating quencheed steel to a temperature well below redness and then cooling it slowly.

A. Tempering , Nitriding, Annealing and Quenching respectively

B. Quenching,Nitriding, Annealing and case Hardening respectively

C. Tempering , Case hardening ,Quenching Annealing respectively

D. Annealing ,Nitriding,Quenching , and Quenching Tempering respectively

Answer: D

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

$$PbS \xrightarrow[\Delta]{\text{air}} PbO + SO_2$$
$$\overset{C}{\longrightarrow} Pb + CO_2$$

$$PbS \xrightarrow[\Delta]{\text{air}} PbO + PbS$$
$$\longrightarrow Pb + SO_2$$

$$PbS \xrightarrow[\Delta]{\text{air}} PbO + SO_2$$
$$\overset{CO}{\longrightarrow} Pb + CO_2$$

Self- reduction process is:

A. X

B. Y

C. Z

D. None of these

Answer: B

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141. Identify the metal M whose extraction is bsed on the following reaction:

$$MS + 2O_2 \rightarrow MSO_4$$

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

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

$$MS + MSO_4 \rightarrow 2M + 2SO_2$$
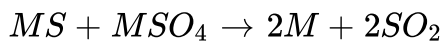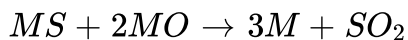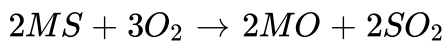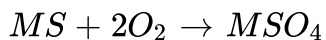
A. magnesium

B. aluminium

C. lead

D. tin

Answer: C

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

A. (a) $\begin{cases} HgS + O_2 \longrightarrow HgO + SO_2 \\ HgO + HgS \longrightarrow Hg + SO_2 \end{cases}$

B. (b) $\begin{cases} Cu_2S + O_2 \longrightarrow Cu_2O + SO_2 \\ Cu_2S + Cu_2O \longrightarrow Cu + SO_2 \end{cases}$

C. (c) $\begin{cases} PbS + O_2 \longrightarrow PbO + SO_2 \\ PbO + PbS \longrightarrow Pb + SO_2 \end{cases}$
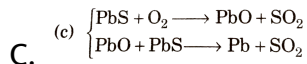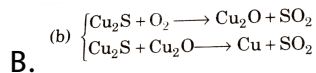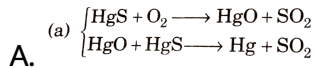
D. All of the above

Answer: D

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143. The chemical composition of slag formed during the smelting process in the extraction of copper is

A. $Cu_2O + FeS$

B. $FeSiO_3$

C. $CuFeS_2$

D. $Cu_2S + FeO$
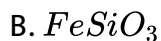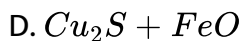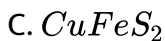
Answer: B

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144. Give the correct of initials T or F following statemetns. Use T if statement is true and F if it is false.

(P) Cu metal is extracted from its sulphide by reduction of $Cu_2O with FeS$.

(Q) An ore of Tin containing $FeWO_4$ is concentrated by magnetic separation method.

(R) Auto redcuton process is used in the extraction of Cu and Hg. Cassiterite and Rutile are oxide ore of the metals.

A. TFTT

B. TTFT

C. FTTT

D. FFFT

Answer: C

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145. Electric furnaces are lined with magnesia because

A. it is not affected by acids

B. it liberates oxygen on heating

C. it melts only at very high temperature

D. it has no effect of electricity

Answer: C

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146. Reduction of a metal oxide by excess carbon at high temperature is a method for the commercial preparation of some metals. This method can be sucessfully applied in the case of:

A. Be and Al_2O_3

B. it liberates oxygen on heating

C. CaO and Cr_2O_3

D. BaO and U_3O_8

Answer: B

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147. SnO_2 is reduced to metallic Sn on smelting oxide with anthracte, limestone and sand. In this, function of sand is:

A. it acts as a flux

B. it liberates oxygen on heating

C. both are correct

D. none is correct

Answer: C

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148. 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. it liberates oxygen on heating

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

A. metal carbonate

B. it liberates oxygen on heating

C. metal oxide

D. metal nitrate

Answer: B

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

A. $CaSiO_3$

B. it liberates oxygen on heating

C. Fe_2O_3

D. $FeSiO_3$

Answer: A

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

A. silica

B. it liberates oxygen on heating

C. lime stone

D. coke

Answer: C

152. The chemical process in the production of steel from haematite ore involves

    A. reduction

    B. it liberates oxygen on heating

    C. reduction followed by oxidation

    D. oxidation followed by reduction

Answer: C

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153. 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. $2CuFeS + 3O_2 \rightarrow 2Cu_2O + 2SO_2$

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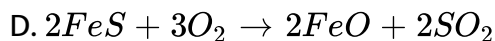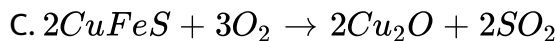
Answer: A

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154. 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 sulphide is removed as fusible 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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155. Which of the following steel treatement process is applicable for softening of the steel?

    A. Leaching

    B. Quenching

    C. Nitriding

    D. Annealing

Answer: D

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156. Spiegel (or spiegleisen), used in the manufacture of steel by the Bessemer process is an alloy of?

    A. Iron, nickel and carbon

B. Iron, managnese and carbon

C. Iron, tungsten and carbon

D. Iron, chromium and carbon

Answer: B

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157. Which of the following metal is extracted from the process of the process of hydrometallurgy?

A. Sn

B. Mg

C. Zn

D. Cu

Answer: B

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158. The chemical composition of slag formed during the smelting process in the extraction of copper is

A. $Cu_2S + FeS$

B. $FeSiO_3$

C. $CaSiO_3$

D. $Cu_2S + FeO$
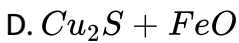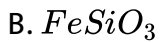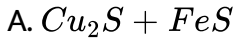
Answer: B

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159. Main source of lead is galena (PbS). It is converted to Pb by :

$PbS \xrightarrow[\Delta]{air} PbO + SO_2$
$\quad\quad\quad\quad \llcorner \xrightarrow{c} Pb + CO_2$

(B) : $PbS \xrightarrow[\Delta]{air} PbO + PbS$
$\quad\quad\quad\quad\quad\quad \llcorner \rightarrow Pb + SO_2$
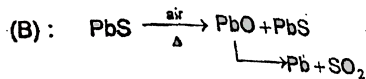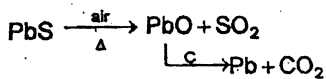
Self $-$ reduction process is :

A. only P

B. only Q

C. both P and Q

D. None of these

Answer: B

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160. which of the following processes involve smelting

A. $ZnCO_3 \xrightarrow{\text{Heat}} ZnO + CO_2$

B. $2Pb + 3O_3 \xrightarrow{\text{Heat}} 2PbO + 2SO_2$

C. $2Al_2O_3.2H_2O \xrightarrow{\text{Heat}} Al_2O + 2H_2O$

D. $Fe_2O_3 + 3C \xrightarrow{\text{Heat}} 2Fe + 3CO$

Answer: D

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161. $Ag_2S + NaCN + Zn \rightarrow Ag$
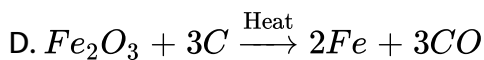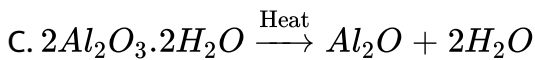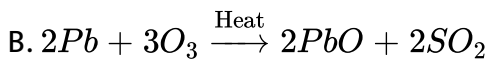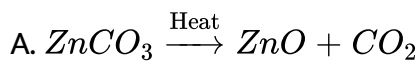
This method of extraction of Ag by complex formation and them its displacement is called.

    A. Parke's method

    B. McArthur-Forest method

    C. Serpeck method

    D. Hall's method

Answer: B

162. The smelting of iron in a blast furance involves all the steps except

    A. reduction

B. fusion

C. decomposition

D. sublimation

Answer: D

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163. Before introducing FeO in blast furance, it is converted to Fe_2O_3 by roasting so that

A. it may not be removed as slag with silica

B. it may not evaporate in the furncae

C. Presence of it mauy increase the m.ot. Of charge

D. None of these

Answer: A

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164. The sulphide ore of copper are heated in reverberatory furnace. If the ore contains iron, it is mixed with silica (SiO_2) before heating. Iron oxide slags off as iron silicate then SiO_2 acts as a:

    A. reducing agent

    B. flux

    C. oxidising agent

    D. None of these

Answer: B

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165. Which of the following process involves smelting

    A. $2PbS + 3O_2 \rightarrow 2PbP + 3SO_2 \uparrow$

B. $Al_2O_3.2H_2O \rightarrow Al_2O_3 + 2H_2O$

C. $Fe_2O_3 + CO \rightarrow 2Fe + 2CO_2$

D. $Cr_2O_3 + 2Al \rightarrow Al_2O_3 + 2Cr + Heat$
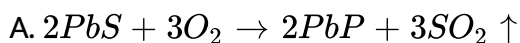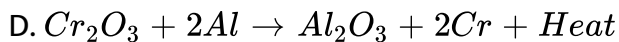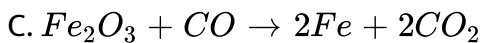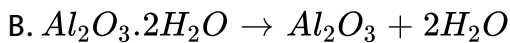
Answer: C

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

A. $Cu_2S + \dfrac{3}{2}O_2 \rightarrow Cu_2O + SO_2,$

$CuO + C \rightarrow Cu + CO$

B. $Cu_2S + \dfrac{3}{2}O_2 \rightarrow Cu_2O + SO_2,$

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

C. $Cu_2S + 2O_2 \rightarrow CuSO_4,$

$Cu_2SO_4 + Cu_2S \rightarrow 2Cu + CO_2$

D. $Cu_2S + \dfrac{3}{2}O_2 \rightarrow Cu_2O + SO_2,$

$Cu_2O + 2CO \rightarrow 2Cu + CO_2$
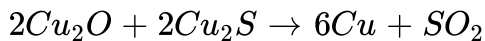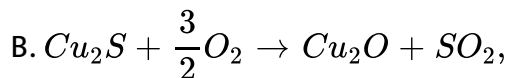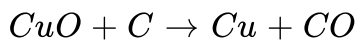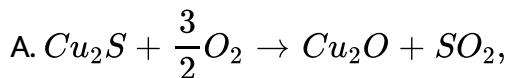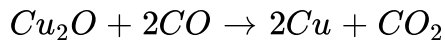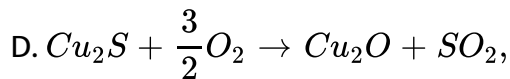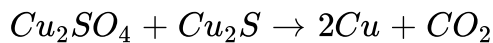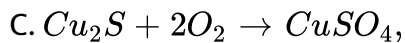
Answer: B

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167. Which of the following reaction is not involved in thermite process?

A. $2Mn_3O_4 + 8Al \rightarrow 9Mn + 4Al_2O_3$

B. $Cr_2O_3 + 2Al \rightarrow Al_2O_3 + 2Cr$

C. $2Fe + Al_2O_3 \rightarrow 2Al + Fe_2O_3$

D. $B_2O_3 + 2Al \rightarrow 2B + Al_2O_3$
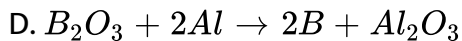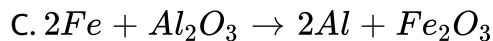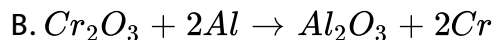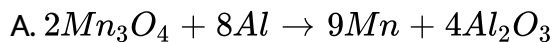
Answer: C

168. Which of the following statement is correct?

A. $CuCO_3.\ Cu(OH)_2$ is concentrated by froth floatiation method using NaCN

B. Calcination, roasting both are only thermal

C. In reverberatory furnace when ore is heated with excess O_2 is called calcination

D. Commercial extraction of Ti is done by thermite process

Answer: D

169. Which of the following conversion is correct for indicated process?

A. $PbSO_4 \rightarrow PbO + SO_2 + \dfrac{1}{2}$ (roasting)

B. $PbSO_4 + PbS \rightarrow Pb + SO_2 +$ (self reduction)

C. $2Na\left[Ag(CN)_2\right] + Zn \rightarrow Na_2\left[Zn(CN)_3\right] + 2Ag$(leaching)

D. $CuSO_4(aq.) + 2Ag \rightarrow Ag_2SO_4(aq) + Cu$
   metal displacement method
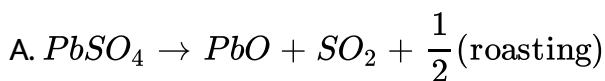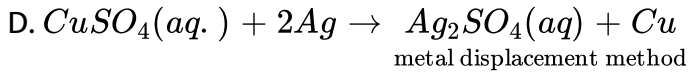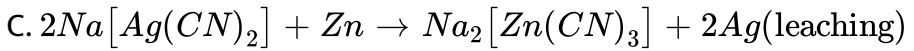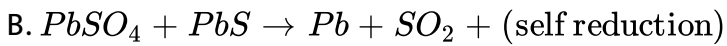
Answer: B

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170. Which form of iron has highest carbon content?

A. Steel

B. Pig iron

C. Cast iron

D. Wrought iron

Answer: B

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171. Ore of a metal $M(X) \xrightarrow{\text{roasting}}$ Roasted ore $\xrightarrow[\text{absence of} O_2]{\Delta \, with \, (X)}$ Metal M

Ore of metal $M(Y) \xrightarrow{\text{calcination}}$ Roasted ore $\xrightarrow[\text{absence of} O_2]{\Delta \, with \, (X)}$ Metal M
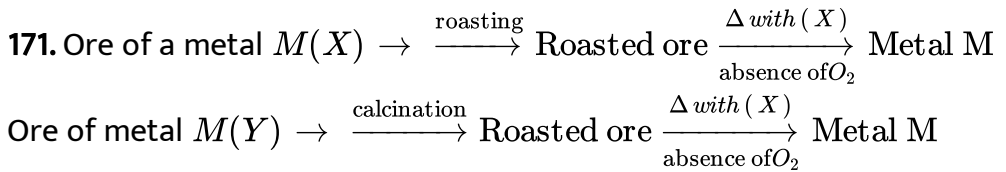
    A. X=chalcocite Y=malachite

    B. X=Galena Y=Cerussite

    C. X-Zinc blende Y=Calamine

    D. a and b both are correct

Answer: D

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172. Blister Cu is about

    A. 60% Cu

    B. 90% Cu

    C. 98% Cu

D. 100% Cu

Answer: C

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173. Silica is added to raosted copper during extraction in order to remove:

    A. Cuprous sulphide

    B. ferrous oxide

    C. ferrous sulphide

    D. curprous oxide

Answer: B

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174. Which of the following statement is correct regarding Cu extraction ?

A. In the smelting step, carbon reduction takes place

B. During partical roasting, Cu_2S remain almost unaffected

C. In Bessemer converter, only self reduction occur, not slag formation

D. Blister formed in the blister of Cu is due to dissolved of CO_2

Answer: B

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175. Refractory materials are generally used in furnaces because

A. they are chemically inert

B. they can withstand high temeprature

C. they do not contain impurities

D. they decrease melting point of ore

Answer: B

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176. Magnesium is extracted from ore carnallite by :

A. the self reduction process

B. the carbon-reduction process

C. the elctrolytic process

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

    mixture

Answer: C

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177. Extraction of silver from Ag_2S by the use of sodium cyanide is example of

    A. roasting

    B. hydrometallurgy

    C. electrometallurgy

    D. smelting

Answer: B

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

    A. nitrogen

    B. oxygen

C. carbon dioxide

D. argoon

Answer: B

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179. $NaC1$ 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 is decreased

D. melting point and conductivity is increased

Answer: A

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180. Which of the following processes of leaching/concentration is not corrrectly matched

    A. Red bauxite Baeyer's process

    B. White bauxite-Serpeck's process

    C. Low grade red bauxite Hall's process

    D. None of these

Answer: D

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181. Which of the following reaction is a part of Hall's process?

    A. $Al_2O_3 + 2NaOH \rightarrow 2NaAlO_2 + H_2O$

    B. $Fe_2O_3 + 2Al \rightarrow 2Fe + Al_2O_3$

    C. $AIN + 3H_2O \rightarrow Al(OH)_3 + NH_3$

D. $Al_2O_3.2H_2O + 2Na_2CO_3 \rightarrow 2NaAlO_2 + CO_2 + 2H_2O$
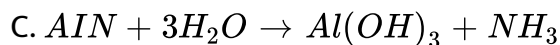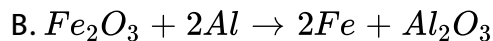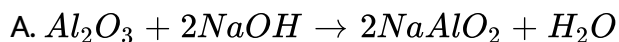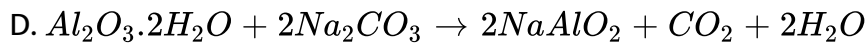
Answer: D

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182. In the leaching of Ag_2S with $NaCN$, a stream air is also passed. It is because of

A. reversible nature of reaction between Ag_2S and NaCN

B. to oxidise Na_2S formed into Na_2SO_4 and sulphur

C. both a and b

D. none of the above

Answer: C

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183. In hydrometallugry process, silver is extracted from argentite ore as:

$$[A] + NaCN \xrightarrow{Air} [B]\text{Complex} + Ag$$

$$[B]\text{Complex} + Zn \rightarrow [C]\text{Complex} + Ag$$

$$Na_2S \xrightarrow{O_2} Na_2SO_4$$

Thenn B is:
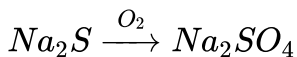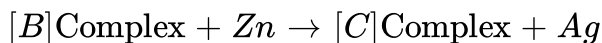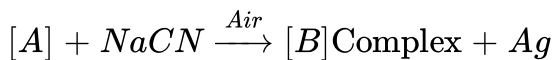
A. paramagnetic and octahedral complex

B. diagramagetic and linear complex

C. coordination of central atom is 6

D. complex $'B'isNa_2[Zn(CN)_4]$

Answer: B

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184. Which metal is extracted using a hydrometallurgical process involving complexation ?

    A. Mg

    B. Ag

    C. Cu

    D. Sn

Answer: B

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185. Which of the following metals cannot be extracted by the carbon reduction process?

    A. Zn

    B. Fe

C. Al

D. Sn

Answer: C

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186. In electrolysis of Al_2O_3 by Hall-Heroult process:

A. cryolite $Na_3[AlF_6]$ lowers the melting point of Al_2O_3 and

increases its elctrical conductivity

B. Al is obtained at cathode and probably CO_2 at anode

C. both a and b are correct

D. None of these

Answer: C

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

    A. Al_2O_3 undergoes dissociation

    B. cryolite undergoes dissociation

    C. Al_2O_3 and cryolite both undergo dissociation

    D. neither of the two undergoes dissociation

Answer: B

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188. During the electrolytic production of aluminium , the carbon anodes are replaced from time to time because

    A. the carbon anodes get decayed

B. the carbon prevents atomostpheric oxygen from comin in contact

with aluminium

C. oxygen liberated at the carbon anodes reacts with anodes to

form CO and CO_2.

D. carbon converts $Al_2O_3 to Al$

Answer: C

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189. Select the correct statement:

A. Leaching is done for low grade ore.

B. Highly reactive elements of group I and group II are extracted by

the electrolysis of aqueous solution of their halides.

C. Iron pyrites is $CuFeS_2$

D. The reaction $Fe_2O_3(s) + 2Al(s) \rightarrow 2Fe(l) + Al_2O_3(s)$ is not feasible.

Answer: A

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190. In the cyanide solution acts as a:

A. Presence of O_2 is required to oxidise Na_2 into Na_2SO_4.

B. Hybridisation of X is sp^2.

C. Complex X is linear in shape.

D. Reaction is a typw of Hydrometallurgy.

Answer: B

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191. In the following process:

$$Ag_2S + NaCN + O_2 \Leftrightarrow \text{Complex}X + Na_2S$$
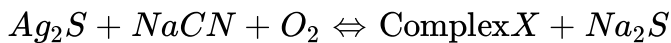
Which option is incorrect for above process?

A. Presence of O_2 is required to oxidise Na_2 into Na_2SO_4.

B. Hybridisation of X is sp^2.

C. Complex X is linear in shape.

D. Reaction is a typw of Hydrometallurgy.

Answer: B

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

A. NaCN only

B. HCl

C. NaOH

D. NaCN in presence of O_2

Answer: D

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193. Which of the following term is not related to Al extraction

A. Serpeck's process

B. Hall-Heroult's process

C. Thermite process

D. Hoopes process

Answer: C

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194. Cryolite is:

A. Na_3AlF_6 and is used in the electrolysis of aluminia for decreasing electrical conductivity.

B. Na_3AlF_6 and is used in the electrolysis of laumina for loweing the meting point of alumina.

C. Na_3AlF_6 and is used in the elctrolytic purification of aluminia.

D. Na_3AlF_6 and is used in the electrolysis of alumina for increasing the melting point and electrical conductivity.

Answer: B

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195. Consider the following metallurgical process:

(P) Heating impure metal with CO and distilling the resulting volatile cabonyl $(b. p. 43°C)$ and finally decomposing at $150° - 200°C$ to get

the pure metal.

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

(R) Electrolysis of the molten electrolyte containing approximately equal amounts of the metal chloride and NaCl to obtian the metal

The processes used for obtaining manesium nickel and copper are respectively:

A. P,Q and R only

B. Q,R and P

C. R,P and Q

D. Q,P and R

Answer: C

196. Silver ore dissolve in the dilute solution of NaCN in the presence of air to form:

A. AgCN

B. $\left[Ag(CN)_2\right]^-$

C. AgCNO

D. $\left[Ag(CN)_3\right]^{3-}$
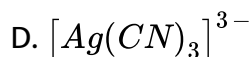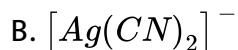
Answer: B

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197. Select the correct statement.

A. Group I and group II elements are generally extracted by the elctrolysis of aqueous solution of their chlorides.

B. Irona is extracted by aluminio-thermic process.

C. Calcination and roasting involve heating of concentrated ores above their fusion temperature

D. Lead can be extracted by carbon reduction as welll as self reduction method.

Answer: D

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

A. in the presence of NaCl

B. in the presence of BaF_2

C. in the presence of cryolite which forms a melt with lower melting temperature

D. in the presence of cryolite which forms a melting with higher

melting temperature

Answer: C

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199. Aluminium is extracted in the electrolysis of :

A. alumina

B. bauxite

C. moleten cryolite

D. aluminia mixed with molten cryolite

Answer: D

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200. Which of the followin reactions Is not involved in Serpeck's process of leaching of Al_2O_3 from white bauxite ore?

A. $Al_2O_3 + N_2 + 3C \xrightarrow{\Delta} 2AIN + 3CO$

B. $SiO_2 + N_2 + C \xrightarrow{\Delta} Si + 2CO$

C. $Na_2CO_3 + Al_2O_3 \xrightarrow{\Delta} 2NaAlO_3 + CO_2$

D. $2Al(OH)_3 oversert(\Delta) \rightarrow Al_2O_3 + 3H_2O$
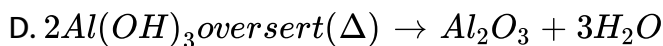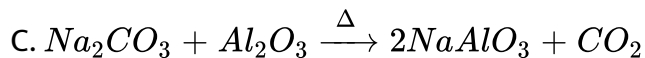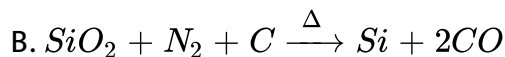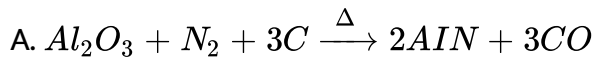
Answer: C

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201. The metal extracted by leaching with cyanide is

A. Mg

B. Ag

C. Cu

D. Na

Answer: B

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202. 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 deposit of aluminium

D. make the melt heavier

Answer: D

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203. Extraction of silver form its ore involving NaCN, air and an active metal is known as:

    A. Pattinson's method

    B. Amalgamation method

    C. Mc Arthur forest method

    D. Parke'e mehtod 0

Answer: C

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204. 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=Serpecks's process and Y= iron oxide

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

Answer: B

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205. Magnesium is extracted electrolysing fused magnesium chloride containing $NaCl$ and $CaCl_2$ using:

    A. a nickel cathode and a graphite anode

    B. the iron container as anode a nikel cathode

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

D. the nickel container as cathode and iron anode

Answer: C

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206. During the electrolysis of fused carnalite, $MgCl_2$ is decomposed to liberate Mg at cathode and not KCl to liberate the K at cathode. This is because of:

A. lower decomposition voltage of $MgCl_2$ than that of KCl

B. higher decomposition voltage of $MgCl_2$ than that of KCl

C. higher melting point of $MgCl_2$ than KCl

D. none of the above

Answer: A

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

A. Fused salt electrolysis

B. Self reduction

C. Aqueous solution electrolysis

D. Thermite reduction

Answer: A

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208. In the process of extraction of gold,

Roasted gold ore $+ CN^- + H_2O \xrightarrow{O_2} [X] + OH^-$

$[X] + Zn \rightarrow [Y] + Au$
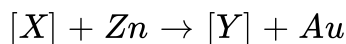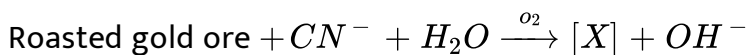
Identify the complexes [X] and [Y]

A. $X = \left[Au(CN)_2\right]^- = Y = \left[Zn(CN)_4\right]^{2-}$

B. $X = \left[Au(CN)_4\right]^{3-} = Y = \left[Zn(CN)_4\right]^{2-}$

C. $X = \left[Au(CN)_2\right]^{-} = Y = \left[Zn(CN)_5\right]^{4-}$

D. $X = \left[Au(CN)_4\right]^{-} = Y = \left[Zn(CN)_4\right]^{2-}$
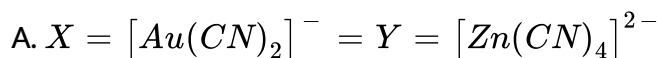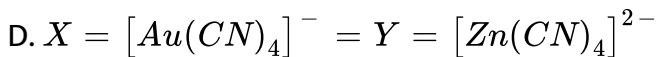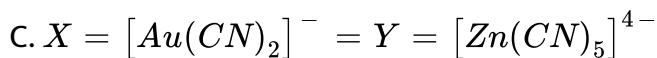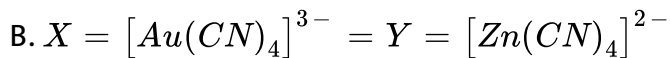
Answer: A

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209. From the low grade copper ore, leached copper can be reduced by either zinc or iron but iron is given preference over zinc because:

A. iron is more reactive than zinc

B. iron is less costlier metal than zinc

C. melting point of iron is low

D. iron can aquire +3 oxidation state while Zn can acquire +2 oxidation state

Answer: B

210. A mixture containing chlorides of sodium, calcium and zinc is electrolysed in presence of water. The product obtianed at cathode will be:

A. Na

B. H_2

C. Ca

D. Zn

Answer: B

211. Electrolysis is used commercially to isolate which metas(s):

(P) (Q) Fe

A. P only

B. Q only

C. both P and Q

D. Neither P nor Q

Answer: A

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212. Coke powderis spreaded over the molten elctrolyte in electrolytic reduction of Al_2O_3 in order to:

A. prevent in electrolytic redcution from the surface

B. prevent the corrosion of graphite anode.

C. prevent oxidation of molten aluminium by air.

D. Both a and b

Answer: D

213. Which of the following reaction is an example of reduction of calcined or roasted or into metal?

A. $\mathrm{Bauxite\ ore} + Na_2CO_3 \xrightarrow{\text{fused}} NaAlO_2$

B. $Ag_2S + NaCN \Leftrightarrow Na\left[Ag(CN)_2\right] + Na_2S$

C. $ZnO + C \rightarrow Zn + CO$

D. $CuSO_4(aq.) + \underset{\text{dust}}{Zn} \rightarrow ZnSO_4 + Cu$
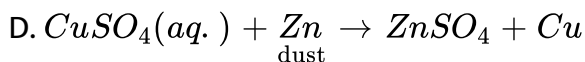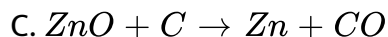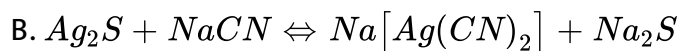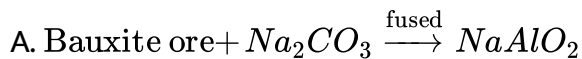
Answer: C

214. The element which could be extracted by electrolytic reduction of its oxide dissolved in a high temperature melt is:

A. sodium

B. magnesium

C. fluroine

D. aluminium

Answer: D

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215. Which of the following statements is correct

A. Leaching of gold with $\overset{\ominus}{CN}$ is an oxidation reaction

B. Argentite is an oxide ore of silver

C. In the precipotation of gold from the soluble complex, zinc acts

    as a reducing agent

D. a and c both

Answer: D

216. Read the following statements:

Choose the correct set of statement(s):

(P) Al has greater affionity than that of Fe. For oxygen

(Q) Cast iron of nickel impurity of zinc and lead

(R) Refining of nickel is done by vapour phase refning

`(S) In cyanide proces, oxygen and zinc dust are used as oxidising agent

and reducing agent respectively:

 A. P,R

 B. Q,R,S

 C. P,R,S

 D. P,S

Answer: C

217. The process of the extraction of gold involves:

    A. Parke's process

    B. Cyanide process

    C. both a and b

    D. none of these

Answer: B

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218. Which of the following term is not related to Al extraction

    A. Serpeck's process

    B. Hall-Heroult's process

    C. Thermite process

    D. Hoopes process

Answer: C

219. The following flow diagram represents the extraction of magnesium from sea water?

$$\text{Sea water} \xrightarrow{\text{(P)}} \text{Mg(OH)}_2 \xrightarrow{\text{(Q)}} \text{MgCl}_2 + \text{H}_2\text{O}$$

$$\downarrow \text{Crystallisation}$$

$$\text{Magnesium} \xleftarrow{\text{(T)}} \text{Anhydrous} \xleftarrow{\text{(S)}} \text{(R)}$$
$$\text{MgCl}_2$$

Which of the following option describes the correct reactants, product and reaction conditions?

	(A)	(B)	(C)	(D)
(P)	Milk of magnesia	Lime water	Milk of lime	Milk of lime
(Q)	HCl(aq)	HCl(aq)	HCl(aq)	HCl(aq)
(R)	$MgCl_2 \cdot 2H_2O$	$MgCl_2$	$MgCl_2 \cdot 6H_2O$	$MgCl_2 \cdot 6H_2O$
(S)	Heating in limited supply of air	Heating in absence of air	Heating in presence of dry HCl	Heating in presence of dry HCl
(T)	Reduction by coke	Electrolytic reduction in molten state	Electrolytic reduction in molten state	Electrolysis of aqueous solution

220. Dow's process

    A. involves purification of copper

    B. involves extraction of magnesium

    C. gives metal chlorideas product

    D. gives pure Na as product

Answer: B

221. 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, Na_3AlF_6 and CaF_2

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

Answer: C

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222. During electrolytic conductance and lower the temperature of melt in order to make fused mixture very conducting. X and Y are:

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223. For extraction of sodium from $NaC1$, the electrolytic mixture $Nac1 + Na_3A1F_6 + Cacl_2$ 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 les reactive than K and Ca

C. NaCl is less stable than Na_3AlF_6 and $CaCl_2$

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

Answer: D

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224. Carnallite on electrolysis gives

A. Ca and Cl_2

B. Na and CO_2

C. Al and Cl_2

D. Mg and Cl_2

Answer: D

225. What will occur if a block of copper metal is dropped into a beaker containing a solution of $1MZnSO_4$?

    A. The copper metal will dissolve and zinc metal will be deposited.

    B. No reactio will occur.

    C. The copper metal will dissolve with evolution oxygen gas.

    D. The copper metal will dissolve with evolution of hydrogen gas.

Answer: B

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226. Poiling process:

    A. reduces $SnO_2 to Sn$

    B. oxidises impurities like iron and removes them as scum

C. uses green poles

D. all of the above are correct

Answer: D

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227. Poiling process is used for:

A. the removal of Cu_2O om Cu

B. the removal of Al_2O_3 om Al

C. the removal Fe_2O_3 om Fe

D. Purification of silver

Answer: A

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228. Aluminium metal is purified by :

A. Hoopes process

B. Hall-Heroult's process

C. Serpeck process

D. Baeyer's process

Answer: A

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229. Which of the following metals may be present in the anode mud during electrorefining of copper?

A. P and Q

B. Q and S

C. P and R

D. R and S

Answer: C

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230. Which one of the following process involves in the principle of fractional crystallisation for the refining of impure metals?

A. Parker's process

B. Mond's process

C. van-Arkel's process

D. zone refining

Answer: D

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231. High purity copper metal is obtained by

    A. carbon reduction

    B. hyrdrogen reduction

    C. electrolytic reduction

    D. Thermite reduction

Answer: C

232. In electrolytic refining of lead, Sb, Cu, Ag and Au are found:

    A. on anode

    B. in electrolyte solution

    C. in anode mud

    D. in cathode mud

Answer: C

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233. The anode mud in the electrolytic refining of silver contains :

A. Zn.Cu,Ag.Au

B. Zn,Ag,Au

C. Cu,Ag,Au

D. Au only

Answer: D

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234. Silver can be separated form lead by:

A. fractional crystallisation

B. liquation

C. cupellation

D. addition of zinc (Parke's method)

Answer: D

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235. In electrolytic refining of lead, relectrolyte consists of:

A. $H_2 SiF_6$ only

B. $Pb_2 SiF_6$ only

C. $H_2 SiF_6$ only

D. $H_2 SiF_6$ and $PnSiF_6$

Answer: D

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

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

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

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

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

Answer: D

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237. Which does not represent correct method ?

A. $TiCl_2 + 2Mg \rightarrow Ti + 2MgCl_2$: Kroll

B. $Ni(CO)_4 \rightarrow Ni + 4CO$: Mond
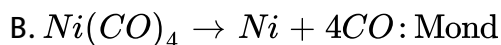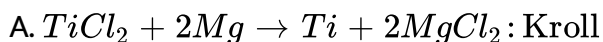
C. $Ag_2CO_3 \rightarrow 2Ag + CO_2 + O_2$: Van Arkel

D. $ZrI_4 \rightarrow Zr + 2I_2$: Van Arkel

Answer: C

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238. Which is correct process-mineral group in metallurgical extraction

?

A. leaching:silver

B. Zone-refining:lead

C. Liquation:tin

D. Van Arkel:Zr

Answer: B

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

    A. Sn and Ag

    B. Pn and Zn

    C. Ag and Au

    D. Fe and Ni

Answer: C

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

    A. liquaiton

    B. distillation

C. zone reffing

D. cupellation

Answer: D

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241. AgCl on fusion with Na_2CO_3 forms:

A. Ag_2CO_3

B. Ag_2O

C. Ag

D. Ag_2C_2

Answer: C

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242. Give the correct order of initials T and F for for following statements. Use T if stament is true and F it is false.

(P) In Gold Schmidt thermite process, aluminium acts as a reducing agent.

(Q) Mg is extracted by electrolysis of aq. Solution $MgCl_2$.

(R) Extraction of Pb is possible by smelting.

(S) Red bauxite is purified by Serpeck's process.

A. TTTF

B. TFFT

C. FTTT

D. TFTF

Answer: D

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

 A. When the lead silver alloy is rich is silver, lead is removed by the cupllation process.

 B. When the lead silver alloy is rich in lead, silver is removed by parke's or pattinsion's process.

 C. Zinc forms an alloy with lead, from whihc lead is separated by distallation.

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

Answer: C

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

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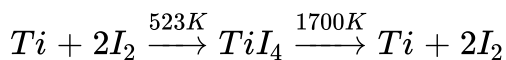
A. Cupellation

B. Poiling

C. Van Arkel

D. Zone refining

Answer: C

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245. Formation of volatile $Ni(CO)_4$ and then its subsquent decomposition into Ni and CO makes basis of Mond's process:

$$Ni + 4CO \xrightarrow{T_1} Ni(CO)_4 \xrightarrow{T_2} Ni4CO_3$$
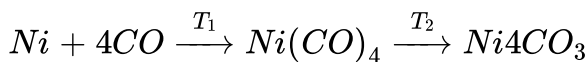
T_1 and T_2 are:

A. $100°C, 50°C$

B. $50°C, 100°C$

C. $50°C, 200°C$

D. $200°C, 50°C$

Answer: C

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

A. Distillation:zinc and mercury

B. Liquation:tin

C. Van Arkel:titanium

D. Mond's process:Lead

Answer: D

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247. Consider the following isolatin/purification pocess:

(P) Heating impure metal with $I_2 at 150 - 200°C$ and passing the resulting volatile iodidle on hot tungsten filament at $1400°C$ to get the pure metal.

(Q) Heating the sulphide ore in air unitil 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.

(R) Electrolysis of the molten electrolyte containing metal oxide and cryolite or flourspar to obtain the metal

The process used for obtaining aluminium, titanium and lead are respectively,

A. P,Q and R only

B. Q,R and P

C. R,P and Q

D. Q,P and R

Answer: C

---

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

    A. iodide of the metal

    B. pure metal

    C. impurities react with iodine

    D. none of these

Answer: D

---

249. Refining to impure copper with zinc impurity ist o be done be electrolysis using electrodes as:

	Cathod	Anode
A.	(a)pure copper	pure zinc
B.	(a)pure zinc	pure copper
C.	(a)pure coper	impure copper
D.	(a)pure zinc	impure zinc

Answer: C

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250. Van Arkel method of purification of metals involves converting the metal to

A. volatile stable compound

B. volatile unstable compound

C. non-volatile compound

D. none of the above

Answer: B

251. Copper and tin are refined by:

A. liquaiton

B. cupellation

C. bessermerisation

D. poling

Answer: D

252. The process of zone refining is used for :

A. silicon

B. germanium

C. gallium

D. all of these

Answer: D

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253. Tin and zinc can be refined by:

A. Cupellation

B. liquation

C. poling

D. bessemerisation

Answer: B

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254. Which of the following option is incorrect

A. B is purified by Van Arkel method because BI_3 is volatile iodile.

B. Si and Ge are purified by Zone refining method.

C. Chemical reaction: $Fe_2O_3 + Al \rightarrow Al_2O_3 + Fe$

("its an endothermic process)

D. The affinity of Cu^{2+} towards S^{-2} is more than O^{-2}

Answer: C

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255. In the following chemical reaciton:

$TiCl_4 + Na \rightarrow M + compoud$
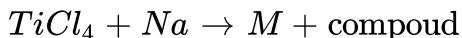
M(metal) is purified by:

A. Van Arkel method

B. E.R.M method

C. Mond process

D. Zone refining method

Answer: A

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256. Poling method is used for the purification of:

A. Pb and Sn

B. Pb and Cr

C. Sn and Cu

D. Fe and Pb

Answer: C

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257. Which of the following is a purificaiton method

`(P) Besserisation (q) Levigation

(R) VanArkel method (S) Leaching

    A. P,Q and R only

    B. P and R

    C. Q and S

    D. Q,R and S

Answer: B

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258. Van Arkel method can be applied for the purification of:

    A. B

    B. Zr

C. Ti

D. all of these

Answer: D

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259. Consider the following statement:

Statement-1: Poiling process is used to refinning of copper and lead.

Statement-2: The scavenger which is used in the manufacture of steel is maganese.

Statement-3: The chemical comosition of mattert in $Cu_2O + Cu_2S$.

Statement-4: In the extraction of aluminium from aluminia Al_2O_3 undergoes dissociation.

And arrange in the order of ture/false

A. FTFF

B. TTFF

C. FFTT

D. TTFT

Answer: A

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260. $TiCl_4 + Na \xrightarrow{\Delta} (X) + \text{compound}$

A. Van Arkel method

B. Mond's process

C. Zone refining method

D. Parke's method

Answer: C

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261. Which of the following option is incorrect

    A. Fe_2O_3 can be reduce by coke as well as aluminium.

    B. Red bauxite is concentrate by leaching method.

    C. Impure Zn is purified by either distilation or electrolytic refining

      method

    D. Pig rion is a purest form of iron.

Answer: D

262. Desilverisation process is used for:

    A. Cu

    B. Pb

    C. Sn and Cu

D. Fe

Answer: B

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263. $M \xrightarrow{KCN_{aq}.\,Air} [M(CN)_2]^-$ (soluble in water)

$M \xrightarrow{\Delta,\,C} [M(CO)_4]^-$ (volatile complex)

$M \xrightarrow{I_2,\,\Delta} MI_4^-$ (volatile iodide)
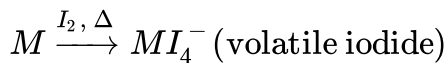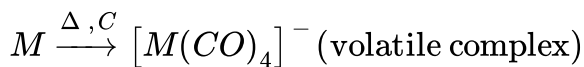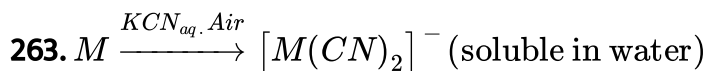
Metals in reaction (i),(ii) and (iii) are respectively

A. Au,Ni,Ti

B. Ni,Au,Ti

C. Ag,Zn,Ti

D. Ag,Ni,Pb

Answer: A

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264. Softening of lead means

    A. melting pure lead at high temperature

    B. removal of impurities, except silver, present in commercial lead.

    C. formation on of lead alloy

    D. formation of 100% pure lead

Answer: B

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265. Which of the following metal is NOT purified by Van Arkel method

    A. Ti

    B. Zr

    C. Ni

D. Hf

Answer: C

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266. From gold amalgam, gold may be recovered by:

A. addition of Zn metal

B. electrolytic refining

C. distillation

D. dissolving Hg in HNO_3

Answer: C

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267. The purest form of metal can be obtained by:

(a) electrolytic refining (b) puddling

(c) zone refining (d) chromatorgraphy

    A. electrolytic refining

    B. pudding

    C. zone refining

    D. chromatography

Answer: C

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268.

$$(Ag + Pb)alloy \xrightarrow{\text{Melt and add zinc}} (Ag + Pb + Zn)\text{melt} \xrightarrow{\text{Cool}} \frac{LayerX}{LayerY}$$
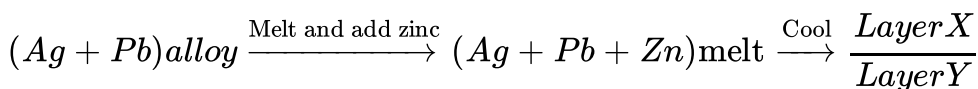
Select correct statements based on above scheme:

    A. Layer X contains zinc and silver.

B. Layer Y conatins 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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269. The metal for which, its property of formation of volatile complex is

taken into accoutn for its purificaiton is:

A. cobalt

B. nickel

C. vandium

D. iron

Answer: B

270. Which of the following statemetn is/are incorrect?

A. Combination of tin stone and wolframite is non magnetic.

B. No external reducing agent is required for the extraction of Hg from HgO.

C. For Cu extraction in bessmer converter, the process like slag formation, oxidation and reduction take takes.

D. Poling method is mainly used when impure metal is having its oxide as impurity.

Answer: A

271. High purity copper metal is obtained by

A. carbon reduction

B. hydrogen reduction

C. electrolutic redcution

D. Thermite reduction

Answer: C

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272. In the extraction of nickel of Mond's process, the metal is obtained by:

A. electrochemical reduction

B. thermal decomposition

C. chemical rduciton by aluminium

D. reduction by carbon

Answer: B

273. Zone refinning is based on the principle of:

A. fractional distillation

B. fractional crystallisation

C. partition coefficient

D. chromatographic separation

Answer: B

274. Si and Ge used for semiconductors are required to br of high purity nad hence purified by:

A. zone refining

B. electrorefining

C. Van Arkel's process

D. cupellation process

Answer: A

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275. Mercury is purified by:

A. passing through dilute HNO_3

B. distillation

C. distribution

D. vapour phase refining

Answer: B

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276. When an impurity in a metal has greater affinity for oxygen and is more easily oxidises then the metal itself. Then, the metal is refined by

A. Cupellation

B. zone refining

C. distillation

D. electrolytic process

Answer: A

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277. Which of the following process is not associated with recovery of the silver

A. As a side producti 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 boiling $Na[Ag(CN)_2]$ aq.

Answer: D

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278. Blister copper is refined by stirring molte impure metal with green logs of wood because such a wood liberates hydrogen gases $(like CH_4)$. This process X is called.....and the metal contains impurities of Y is...

A. X=cupellation, Y=CuO_2

B. X=poling,Y=Cu_2O

C. `X=poling, Y=CuO

D. X=Cupellatio, Y=CuO

Answer: B

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279. A piece of steel is heated until redness and then plunged into cold water or oil. This treatment of steel makes it:

A. soft and allleable

B. hard but not brittle

C. more brittle

D. hard and brittle

Answer: D

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280. Modern method of steel manufacturing is:

A. open heath process

B. L.D. process

C. bessermerisation

D. cupellation

Answer: B

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281. Railway wagon axles are made by heating rods of iron embedded in charcoal powerder. The process is known as

A. sherardising

B. annelaling

C. tempering

D. case hardening

Answer: D

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282. Galvanisation is applying a coating of

A. Zn

B. Pb

C. Cr

D. Cu

Answer: A

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283. Statement-1: Carbon cannot be used as a reducing agent for the extraction of second group metals.

Statement-2: Second group metals are extracted from their fused salts by electrolytic reduction:

    A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explantion for Statement-1.

    B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explantion for Statement-1.

    C. Statement-1 is True, Statement-2 is False.

    D. Statement-1 is True, Statement-2 is True.

Answer: B

284. 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. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explantion for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explantion for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is True, Statement-2 is True.

Answer: C

285. Statement-1: Aluminium is used as reducing agent in the commercial extraction of iron from haematite ore.

Statement--2: Reduction of B_2O_3 to boron by aluminuim is called as Goldschmidt aluminothermicprocess.

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explantion for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explantion for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is True, Statement-2 is True.

Answer: D

⏵ View Text Solution

286. Statement-1:In cyanide process for the extraction of gold and silver from their natives, ores, the cuanide solution acts as a reducing agent to reduce the gold and siver compound present in the ores into the metallic states.

Statement-2:In the extraction of gold and silver, the cyanide solution acts as complexing ragent in the presence of air and form their respective soluble complexes.

   A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explantion for Statement-1.

   B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explantion for Statement-1.

   C. Statement-1 is True, Statement-2 is False.

   D. Statement-1 is True, Statement-2 is True.

Answer: D

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287. Statement-1:Electrolytic reduction of alumina to aluminium by Hall-Heroult process is carried in the presence of cryolite.

Statement-2:Cryolite contains aluminium.

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explantion for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explantion for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is True, Statement-2 is True.

Answer: B

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288. 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. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explantion for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explantion for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is True, Statement-2 is True.

Answer: B

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289. 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. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explantion for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explantion for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is True, Statement-2 is True.

Answer: A

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290. 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. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explantion for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explantion for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is True, Statement-2 is True.

Answer: C

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291. 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. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explantion for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explantion for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is True, Statement-2 is True.

Answer: D

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292. 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. Statement-1 is True, Statement-2 is True, Statement-2 is a correct

   explantion for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a

   correct explantion for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is True, Statement-2 is True.

Answer: B

293. 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. Statement-1 is True, Statement-2 is True, Statement-2 is a correct

explantion for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a

correct explantion for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is True, Statement-2 is True.

Answer: D

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294. Statement-1:Galena on heating in a reverberatory furnace above the melting point of metal gives metallic lead.

Statement-2: Galena is partically converted to PbO and $PbSO_4$ which ar reduced by excess galena to metallic lead.

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explantion for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explantion for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is True, Statement-2 is True.

Answer: A

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295. Statement-1: The reduction of a metal oxide is easier if the metal formed is in liquid state at he temperature of reduction.

Statement-2: The value of entropy change ΔS of the reduction process is more on +ve side when the metal formed is in liquid state and the metal oxide being reduced in a solid state. Thus, the value of the ΔG becomes more or negative side.

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explantion for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explantion for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is True, Statement-2 is True.

Answer: A

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

Reason: Zinc can be extracted by hydrometallurgy.

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explantion for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explantion for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is True, Statement-2 is True.

Answer: C

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297. 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. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explantion for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a

correct explantion for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is True, Statement-2 is True.

Answer: C

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298. Statement-1: Oxide ore of iron are concentrated through calcination/roasting in an reverberatory furncae.

Statement-1: The water of crystallisation of hydrated oxide ore get get lost as mositure, carbonate ore get decomposed to form oxide and sulphide if present is oxidised.

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct

explantion for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explantion for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is True, Statement-2 is True.

Answer: A

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299. Statement-1:In the Hoops's process of aluminium purification, the fused materials remains in three different layers. These layers remain intact even in the elctrolytic reduction.

Statement-2: All the layer have different densities.

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explantion for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explantion for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is True, Statement-2 is True.

Answer: A

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300. Assertion : In froth floatation process sodium ethyl xanthate is used as collector.

Reason : Sulphide ores are water soluble.

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explantion for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explantion for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is True, Statement-2 is True.

Answer: C

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301. Statement-1:In the electrolytic reduction of Al_2O_3, cryolite lowes the melting point of the mixture and bring conductivity:

Statement-2: Cryolite is an ore of aluminium.

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explantion for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explantion for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is True, Statement-2 is True.

Answer: B

302. Assertion : Reduction of ZnO with carbon is done at $1100°C$.

Reason : At this temperature, $\Delta G°$ is negative and the process is spontaneous.

- A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explantion for Statement-1.

- B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explantion for Statement-1.

- C. Statement-1 is True, Statement-2 is False.

- D. Statement-1 is True, Statement-2 is True.

Answer: A

303. Statement-1:Graphite is used as anode by not diamond.

Statement-2: Mobile electrons are present in graphite layer which help in the electrical conductivity.

    A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explantion for Statement-1.

    B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explantion for Statement-1.

    C. Statement-1 is True, Statement-2 is False.

    D. Statement-1 is True, Statement-2 is True.

Answer: A

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304. Statement-1: Pb, Sn and Bi are purified by liquation.

Statement-2: Impurities have lower meltin point than metal.

    A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct

       explantion for Statement-1.

    B. Statement-1 is True, Statement-2 is True, Statement-2 is not a

       correct explantion for Statement-1.

    C. Statement-1 is True, Statement-2 is False.

    D. Statement-1 is True, Statement-2 is True.

Answer: C

305. Statement-1: All ores are minaerals but all minerals are not ores.

Statement-2: Minerals are obtained from mines.

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explantion for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explantion for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is True, Statement-2 is True.

Answer: B

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306. Statement-1:Aluminium is the most abundant element in eath crust yet it is obtained from bauxite.

Statement-2: Bauxite is available in large quantities.

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explantion for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explantion for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is True, Statement-2 is True.

Answer: A

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307. Statement-1: In blast funcae inner surface is lining of refractory materials.

Statement-2: These refractory meterials are acidic and basic in nature generally.

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explantion for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a

   correct explantion for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is True, Statement-2 is True.

Answer: B

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308. Statement-1: Platinum and gold occur in native state in nature.

Statement-:Plantinum and gold are noble metals.

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct

   explantion for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a

   correct explantion for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is True, Statement-2 is True.

Answer: A

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309. Statement-1:Sulphide ores are concentrated by froth floatation process.

Statement-2: Pine oil acts as a frothing agent in froth floatation process.

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explantion for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explantion for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is True, Statement-2 is True.

Answer: B

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310. 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. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explantion for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explantion for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is True, Statement-2 is True.

Answer: C

311. Statement-1:Al is used as a reducing agent in aluminothermy.

Statement-2: Al has a power melting point than Fe, Cr and Mn

    A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct

       explantion for Statement-1.

    B. Statement-1 is True, Statement-2 is True, Statement-2 is not a

       correct explantion for Statement-1.

    C. Statement-1 is True, Statement-2 is False.

    D. Statement-1 is True, Statement-2 is True.

Answer: B

312. Statement-1: Alkali metal can not prepared by the elctrolysis of their chlorides in aqueous solution.

Statement-2: Reduction potentials of alkali metals cations is much lower than that H_2O.

    A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explantion for Statement-1.

    B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explantion for Statement-1.

    C. Statement-1 is True, Statement-2 is False.

    D. Statement-1 is True, Statement-2 is True.

Answer: A

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313. Ti can be purified by Van Arkel process.

TiI_4 is a volatile compound which decomposes at a high temperature.

    A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct

       explantion for Statement-1.

    B. Statement-1 is True, Statement-2 is True, Statement-2 is not a

       correct explantion for Statement-1.

    C. Statement-1 is True, Statement-2 is False.

    D. Statement-1 is True, Statement-2 is True.

Answer: A

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314. Statement-1:Nickel is purified by the thermal decomposition of

nickel tetracaerbonyl.

Statement-2: Nickel is a transition element.

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explantion for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explantion for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is True, Statement-2 is True.

Answer: B

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315. Assertion: In smelting process, the roasted ore is heated with powdered coke in presence of flux.

Reason: Oxides are reduced to metal by carbon or CO and impurities are removed as slag.

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explantion for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explantion for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is True, Statement-2 is True.

Answer: A

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316. Statement-1:Magnesia and quick lime are used as basic flux.

Statement-2:MgO and CaO can withstand very high temperatures.

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explantion for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explantion for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is True, Statement-2 is True.

Answer: B

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317. Statement-1: Wolframite impurity is separated from SnO, by magnetic separation.

Statement-2: Tin stone is ferromagnetic, therefore attracted by magnet.

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explantion for Statement-1.

B. Statement-1 is True, Statement-2 is True, Statement-2 is not a correct explantion for Statement-1.

C. Statement-1 is True, Statement-2 is False.

D. Statement-1 is True, Statement-2 is True.

Answer: C

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318. Which of the following process is/are used to refine the metals?
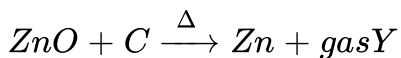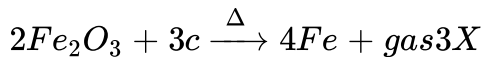
A. levigation

B. Cupellation

C. Mond's process

D. Poling

Answer: B,C,D

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319. In the following carbon reduction process:

$$2Fe_2O_3 + 3c \xrightarrow{\Delta} 4Fe + gas3X$$

$$ZnO + C \xrightarrow{\Delta} Zn + gasY$$

Note: C stands for carbon.

Which of the following option is/are correct regardin X and Y?

A. X is neutral oxide and Y is acidic oxide.

B. Both have $\pi x - \pi x$ bond

C. Both have $\pi - \pi x$ back bond

D. Both have same number of π bonds

Answer: B,D

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320. Poling is used for the purification of:

A. Sn

B. Cu

C. Pb

D. Zn

Answer: A,B

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321. Which of the following option are correct?

A. Wrought iron is a purest form of iron.

B. $Ca_3(PO_4)_2O$ is called Thomas slag, used as a fertilizer.

C. In a puddling process, Fe_2O_3 act as a oxidising agent.

D. $FeSiO_3$ slag is formed during the extraction of Cu.
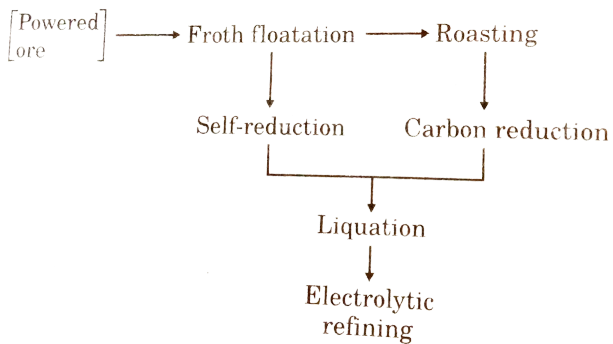
Answer: A,C,D

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322. Dolomite is an ore of:

A. aluminium

B. magnesium

C. calcium

D. potassium

Answer: B,C

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$$\begin{bmatrix} \text{Powered} \\ \text{ore} \end{bmatrix} \longrightarrow \text{Froth floatation} \longrightarrow \text{Roasting}$$

Self-reduction   Carbon reduction

Liquation

Electrolytic
refining

323.

Select the correct option(s).

A. The flow chart represents extraction of Pb from PbS.

B. Concentration of ore involves use of NaCN as depresant.

C. Metal obatined conatins Ag as one of the impurities which is

   removed by Parke's process.

D. Impure metal is very soft.
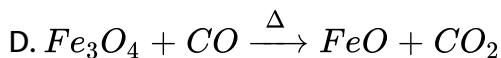
Answer: A,B,C

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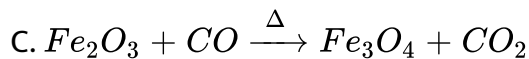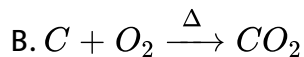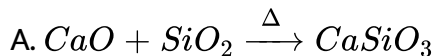**324.** Egg shell is made up of a chemica. IN which of the following ore

this chemical is present?

A. dolomite
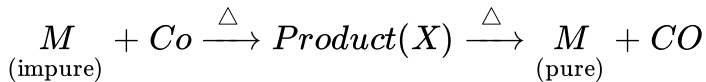
B. Calamine

C. lime stone

D. Feldspar

Answer: A,C

---

325. Which of the following chemical reaction takes place in blast furnace during extraction of iron?

A. $CaO + SiO_2 \xrightarrow{\Delta} CaSiO_3$

B. $C + O_2 \xrightarrow{\Delta} CO_2$

C. $Fe_2O_3 + CO \xrightarrow{\Delta} Fe_3O_4 + CO_2$

D. $Fe_3O_4 + CO \xrightarrow{\Delta} FeO + CO_2$

Answer: A,B,C,D

---

326. Which of the following option is incorrect regarding following process :

$$\underset{(\text{impure})}{M} + Co \xrightarrow{\triangle} Product(X) \xrightarrow{\triangle} \underset{(\text{pure})}{M} + CO$$

A. X is a high spin complex

B. It is Mond's process

C. X is tetrahedral in shape

D. X is diagmagnetic in nature

Answer: A,B

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327. Which of the following is/are manufactured by the electrolysis of their fused salts?

A. copper

B. Sodium

C. Aluminium

D. Platinum

Answer: B,C

328. The smelting of iron in a blast furnace involves, which of the following process(es)?

A. Combustion

B. Redcution

C. Slag formation

D. sublimation

Answer: A,B,C

329. The addition of high proportions of maganese makes steel useful in making rails or railroads because manganese useful in making rails

or railroads because maganese

A. gives hardness to steel

B. helps in the formation of oxides of iron

C. can remove oxygen and sulphur

D. can show highest oxidation state of +7

Answer: A,C

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330. In Poling process of purification of Cu, O_2 oxidises following group of elements.

A. S,Sb,As

B. Sb,As,Fe

C. S,Sb,As

D. As,Ag,Au

Answer: A,B,C

331. Partin of gold may be done with:
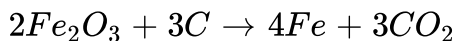
A. sulphuric acid
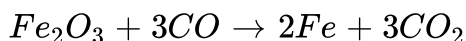
B. sodium hydroxide

C. borax

D. Chlorine$(Cl)_2$

Answer: A,D

332. During the production of iron and steel.

A. The oxide ore is primarily reduced to iron by solid coke according to the reaction:

$$2Fe_2O_3 + 3C \rightarrow 4Fe + 3CO_2$$

B. The oxide ore is reduced by the carbon monoxide according to the reaction

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

C. Major silica impurities are removed as calcium silicate slag by addition of a fluxing agent lime stone.

D. The converter slag containing phosphorus is used as fertilizer.

Answer: B,C,D

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333. Which of the following process is involved in the extraction of corresponding metal when Zinc Blende is used as ore?

A. Calcination

B. Roasting
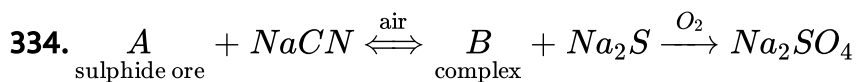
C. froth floatation method

D. Carbon reduction

Answer: B,C,D

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334. $\underset{\text{sulphide ore}}{A} + NaCN \overset{\text{air}}{\Longleftrightarrow} \underset{\text{complex}}{B} + Na_2S \overset{O_2}{\longrightarrow} Na_2SO_4$

then B is:

A. paramagnetic
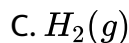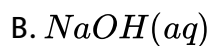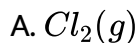
B. diamagnetic

C. coordination number of central atom is 4.

D. coordination number of central atom is 6.

Answer: B

335. What products are formed during the electrolysis of a concentrated aqueous solution of NaCl?

A. $Cl_2(g)$

B. $NaOH(aq)$

C. $H_2(g)$

D. $HClO_3$

Answer: A,B,C

336. Which of the following process(es) occur(s) during the extraction of copper from chalcopyrites?

A. froth floatation method

B. Roasting

C. bessermerisation

D. Calcination

Answer: A,B,C

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337. Calcination and roasting process of ores to form their oxides are beneficial:

A. to convert ores into porous form so that their redcution becomes

easier.

B. as impurities like S, As, Sb, are removed.

C. as organic impurities are removed.

D. as the ores are converted into oxide form which makes the

reduction easier.

Answer: A,B,C,D

---

338. Calcination silicate(slag) formed in the slag formation zone in extraction of iron from haematite ore:

    A. does not dissolve in molten iron

    B. being lighter floats on the molten iron

    C. is used in cement industry and as building material

    D. prvents the re-oxidation of molten iron

Answer: A,B,C,D

---

339. The majore role of flurospar (CaF_2) which is added in small quantities in the electrolytic reduction of aluminia dissolved in fused

cryolite (Na_3AIF_6) is:

   A. as a catalyst

   B. to make the fused mixture very conducting

   C. to lower the temperature of the melting of the molt.

   D. to decrease the rate of oxidatoin of carbon at anode

Answer: B,C

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340. Which of the following statement(s) is (are) incorrect?

   A. In Serpeck's process siliaca is removed by heating the bauxite to

      $1800°C$ with coke in a current of N_2

   B. In extraction of lead from galena roasting and self redcution

      takes places in the same furnace but under different conditions

      of temperatures and supply of air

C. Then tin is obtained by the carbon reduction of black tin

D. none of these

Answer: D

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341. Liquation process may be applied for the purification of:

A. copper

B. tin

C. iron

D. bismuth

Answer: B,D

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342. In the alumino-thermite process, Al acts as :

    A. oxidising agent

    B. flux

    C. reducing agent

    D. solder

Answer: C

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

    A. Cuprite and zincite are oxides ores
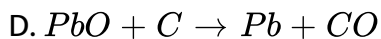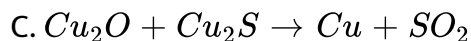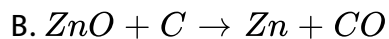
    B. Magnesite and carballite are carbonate ores

    C. Chalcocite and azurite are ores of copper

    D. Feldspar and albite minerals contains aluminium

Answer: A,C,D

---

344. Of the following reduction process, the correct process(es) is/are:

A. $Fe_2O_3 + CO \rightarrow Fe + CO_2$

B. $ZnO + C \rightarrow Zn + CO$

C. $Cu_2O + Cu_2S \rightarrow Cu + SO_2$

D. $PbO + C \rightarrow Pb + CO$

Answer: A,B,C,D

---

345. Roasting of copper pyrites is done:

A. to remove moisture

B. to oxidise free sulphur and antimony

C. to convert pyrite completely into Cu_2O and FeO

D. to remove volatle organic impurities

Answer: A,B,D

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346. In which of the following pairs, both the minerals are oxides ?

A. Sylvine,saltpetre

B. Cassiterite,litharge

C. Siderite,corundum

D. Cuprite,tin stone

Answer: B,D

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347. Select the correct statement(s) with respect to the differences between roasting and calcination

    A. In roasting at higher temperature sulphide ores of the some metal like Cu,Pb,Hg etc., are rduced directly to metal but not in calcination.

    B. Partial fusion occurs in calcination but not in roasting

    C. Calcination is done is limited supply of air or absence of air but in roasting supply of excess air is required.

    D. Combination reaction occurs in roasting but not in calcination.

Answer: A,C

348. Extraction of metal from the ore cassiterite involves

A. carbon reduction of an oxide ore

B. self reduction of a sulphide ore

C. removal of copper impurity

D. removal of iron impurity

Answer: A,D

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349. Select the correct statement:

A. Dolomite conatins both magnesium and calcium.

B. Extraction of lead from galena involves raosting in limited supply

of air at moderate temperature followed by self redcution of

higher temperature (to melt the charge).

C. Extraction of zinc from zinc blende involves roasting followed by

reduction with carbon.

D. The chemical composition of 'slag' formed during the extraction of iron and copper is $FeSiO_3$.

Answer: A,B,C
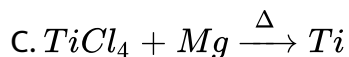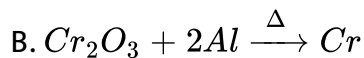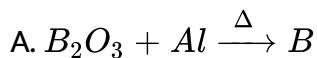
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350. Which of the following statement(s) is/are true for the extraction of tin form ore cassiterite

A. Impurity of wolframite is remvoed by magnetic separation.

B. The concentrated ore containing 60-70% SnO_2 is called as black tin.

C. Tin is obtained by the carbon reduction of SnO_2

D. Angiesite is an another ore of tin.

Answer: A,B,C

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351. Of the following reduction process, the correct process(es) is/are:

A. $B_2O_3 + Al \xrightarrow{\Delta} B$

B. $Cr_2O_3 + 2Al \xrightarrow{\Delta} Cr$

C. $TiCl_4 + Mg \xrightarrow{\Delta} Ti$

D. $PbS + PbO \xrightarrow{\Delta} Pb$

Answer: A,B,C,D

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352. In which of the following extraction no reducing agent is required?

A. Iron from haematitre

B. Aluminium from bauxite

C. Magnesium from carnallite

D. Zinc from zinc blende

Answer: B,C

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353. The smelting of iron in a blast furnace involves the following processes:

A. Combustion

B. reduction

C. Slag formation

D. fusion

Answer: A,B,C,D

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354. Out of Cu_2S, HgS, Ag_2S, PbS and ZnS, roasting will convert, the minerals into metal in case of:

A. Cu_2S, PbS

B. HgS, ZnS

C. Cu_2S, AgS

D. HgS, Cu_2S

Answer: A,C,D

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355. Why lime stone is added in the extraction of lead from galena?

A. It prevents the formation of $PbSO_4$

B. It removes the impurity of silica as fusible slag

C. It convers lead silicate to lead oxide

D. It remove the impurity of iron oxide as fusible

Answer: A,B,C

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356. Which of the following is/are correctly matched?

A. Copper Bessemer converter

B. Iron balst furnace

C. Chromium aluminothermic process

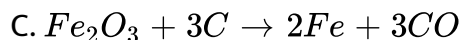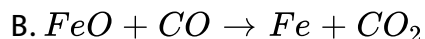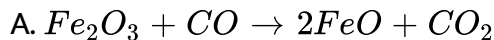D. Tin-electrolytic redcution

Answer: A,B,C

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357. The reaction(s) which (do) not occur in the reduction zone in the extraction of iron from haematite ore is(are):

A. $Fe_2O_3 + CO \rightarrow 2FeO + CO_2$

B. $FeO + CO \rightarrow Fe + CO_2$

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

D. $CaO + SiO_2 \rightarrow CaSiO_3$

Answer: C,D

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358. Which of the following statement(s) is(are) true?

A. In the porcocess of precipitation of silver from sodium dicyanidoargentate (I), the zinc acts as reducing agent as well as complexing agent.

B. In process of the roasting, the copper pyrite is converted into a

mixture of Cu_2S and FeS which, in turn, arepartially oxidised.

C. Limonite, haematite and magnetatie of Cu_2S and FeS Iron

D. Tin and lead both are extracted from their ores by self redcution.

Answer: A,B

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359. Which of the following is a correct statement?

A. Calamine is an ore fo zinc

B. Prostite is a mineral of silver

C. Copper Glance is ore of copper

D. Dias[pre is the ore of aluminium

Answer: A,B,C,D

360. The chemical treatment of the ore for concentration is done in the case of :

    A. aluminium

    B. silver

    C. copper

    D. gold

Answer: A,B,D

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361. Froth floatation:

    A. is a physical method of separation mineral from the gangue

B. is a method of concentration of ore depending on the difference
in wetability of gangue and the ore particles

C. is used for the concentration of sulphide ores

D. is a method in which impurities sink to be bottom and ore
particles pass on the surface with froth

Answer: A,B,C,D

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362. Which of the following pair consists of ore of the same metal ?

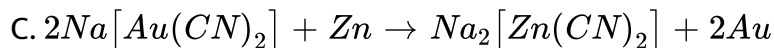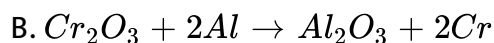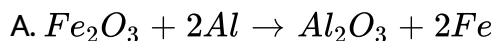A. Bauxite, limonite

B. Haematite,siderite

C. Cinnabar,cassiterite

D. Galena,cerrusite

Answer: B,D

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363. Which of the following reduction are actually employed in commercial extraction of metals?

A. $Fe_2O_3 + 2Al \rightarrow Al_2O_3 + 2Fe$

B. $Cr_2O_3 + 2Al \rightarrow Al_2O_3 + 2Cr$

C. $2Na\left[Au(CN)_2\right] + Zn \rightarrow Na_2\left[Zn(CN)_2\right] + 2Au$

D. $2Cu_2S + 2CuO \rightarrow 6Cu + SO_2$

Answer: B,C,D

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364. Which of the following reaction(s) occurs during calcination?

A. $CaCO_3 \rightarrow CaO + CO_2$

B. $4FeS_2 + 11O_2 \rightarrow 2Fe_2O_3 + 8SO_2$

C. $2Al(OH)_3 \rightarrow Al_2O_3 + 3H_2O$

D. $CuS + CuSO_4 \rightarrow 2Cu + 2SO_2$
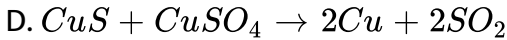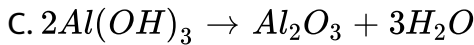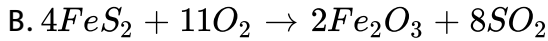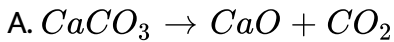
Answer: A,C

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365. Which of the following statements is/are correct?

A. Froth floatation can also be used for non sulphide ores having

sulphide impurities, and the ore is recovered by using suitable

activator.

B. In the leaching of Ag_2S with NaCN, a stream of air is also passed

because of reversible nautre of reaction between

Ag_2S and $NaCN$

C. In hydrometallurgy, Zn is used as an oxidizing agent in the purification of Ag from $\left[Ag(CN)_2\right]^{-}$

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

Answer: A,B,D

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366. Iron is not present in the form of sulphide in:
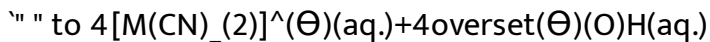
A. fool's gold

B. siderite

C. chalcopyrite

D. limonite

Answer: B,D

367. $4M(s) + \overset{\ominus}{CN}(aq.) + 2H_2O(aq.) + O_2(g)$

`" " to 4[M(CN)_(2)]^(⊖)(aq.)+4overset(⊖)(O)H(aq.)
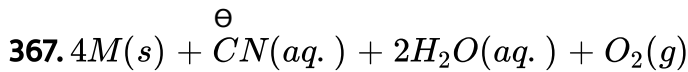
    A. O_2 acts as oxidising agent

    B. $\overset{\ominus}{CN}$ acts as complex forming agent

    C. O_2 and $\overset{\ominus}{CN}$ both act as oxidising agent

    D. O_2 and $\overset{\ominus}{CN}$ both act as complex forming agent

Answer: A,B

368. Select which complex formation reaction is/are incorrect for forward displacement:

    A. $Ag_2S + 8CN^- \rightarrow \left[Ag(CN)_4\right]^- + S^2$

B. $CdSO_4 + 4CN^- \rightarrow [Cu(NH_3)_4] + SO^4$
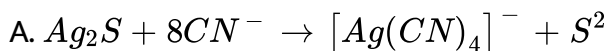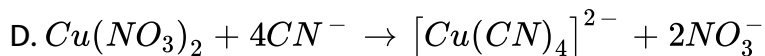
C. $CuSO_4 + 4NH_3 \rightarrow [Cu(NH_3)_4] + SO_4$

D. $Cu(NO_3)_2 + 4CN^- \rightarrow [Cu(CN)_4]^{2-} + 2NO_3^-$
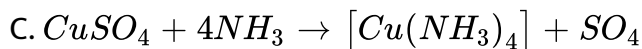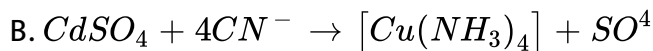
Answer: A,D

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369. Select the correct statement whenlower the position of a metal line in the Ellingham diagram

A. The greater is the stability of it's oxide for example the line for Al (oxidation of Al) is found to be below that for Fe (formation of Fe_2O_3)

B. The greater the gap between any two lines the greater the effectiveness of reducing properties correcsponding to the lower line's metal

C. The intersection of two lines implies an oxidition reduction equilibrium

D. At the point of intersection the free energy change for redox reaction is zero involving change for redox reaction is zero involving metal oxide and metal from that two lines.

Answer: A,B,C,D

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370. Select the correct statement for froth floation method.

A. Collectors enhance non-wettability of mineral particles by water?=

B. Cresols, aniline are used as a froth stabiliser

C. The minerals particles becomes wet by oils while gangue particles by wate

D. Froth floatation method can also be used for non sulphide ore by using suitable activator

Answer: A,B,C,D

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371. The ore in which sulphide is absent.

A. cuprite

B. Argentite is an oxide ore of silver

C. pyrites

D. siderite

Answer: A,D

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372. Which one of the following is not true in elctrolytic refining?

A. Cathode is made up of impure metal

B. Anode is made up impure metal

C. Cathode is of impure metal and anode is of pure metal

D. Both electrodes must be of pure metal

Answer: A,C,D

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373. Metal 'M' is a major component of many igneous minerals including mica and clays then M is:

A. Al

B. the third most abundant element in earth's crust

C. the most abundant metal

D. the most abundant element

Answer: A,B,C

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374. Find the correct statement(s) given below.

A. In magnetic separation, non magnetic particles fall nearer to the

magnetic roller

B. Tea filteration is the good example of leaching process in

everyday life.

C. Magnetic particles fall nearer to the magnetic roler In magnetic

separation method

D. None of these

Answer: B,C

375. Which of the following reaction(s) in blast furnace during extraction of iron?

A. $CaO + SiO_2 \rightarrow CaSiO_3$

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

C. $FeO \rightarrow Fe + \dfrac{1}{2}O_2$

D. $P_2O_5 + 5C \rightarrow \dfrac{1}{2}P_4 + 5CO$
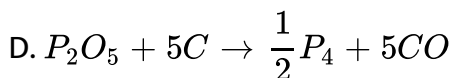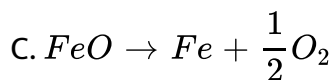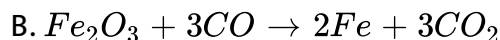
Answer: A,B,D

376. Pitch blende is not the source of:

A. Ra

B. U

C. Ga

D. Th

Answer: A,C

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377. Liquation is used to purify:

A. Pb

B. Sn

C. Bi

D. A,

Answer: A,B,C

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378. Of the following reduction process, correct are (for their commerical extraciton):

A. $Fe_2O_3 + CO \rightarrow Fe + CO_2$

B. $ZnO + C \rightarrow Zn + CO$

C. $Cr_2O_3 + C \rightarrow Cr + CO$

D. $PbO + C \rightarrow Pb + CO$
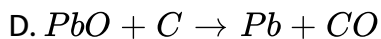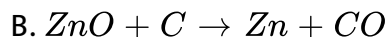
Answer: A,B,D

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379. Which of the following are method of concentration of ore is metals?

A. gravity separation process

B. froth floatation

C. Magnetic seapration

D. Smelting

Answer: A,B,C

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380. Which of the following options are observed during roasting?

A. Convert sulphide to oxide and sulphate

B. Remove water of hydration

C. Melt the ore

D. Remove arsenic and sulphur impurities

Answer: A,B,D

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381. Which of the following electrolyte is used for electrorefining of metal M?

$$M > Z^-, X^-, Y^- < Z^-, X^-, > Z^-, W^-, < X^-$$
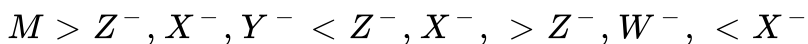
A. MX

B. MZ

C. MY

D. MW

Answer: A,B,C,D

---

382. Which of the following reactions are example of termite reduction?

A. A thermic reaction may start if a ship having Al parts is hit by a missile

B. $Al_2O_3 + 3Mg \xrightarrow{\Delta} 3MgO + 2Al$

C. $Fe_2O_3 + 2Al \xrightarrow{\Delta} 2Fe + Al_2O_3$

D. $Cr_2O_3 + Al \xrightarrow{\Delta} 2Cr + Al_2O_3$

Answer: A,C,D

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383. $M + NaCN + O_2 + H_2O \rightarrow Na[M(CN)_2] + NaOH$
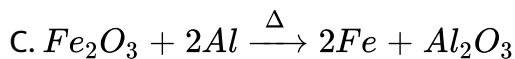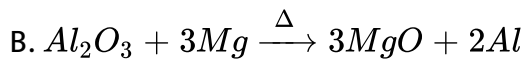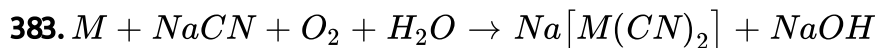
Which of the following elements gets dissolved in samme manner in NaCN solution?

A. Ag

B. Cu

C. Au

D. Pt

Answer: A,C

384. Which of the following statements are not correct?

A. Copper is extracted by self reduction method.

B. Cast iron is the purest form of iron.

C. The concentra of malachite ore is `Cu(OH)_(2).2CuCO_(3)

D. Cupellation process is used for the refining of Ag and Au.

Answer: B,C

385. Which of the following step of metallurgy requires oxygen?

A. Calcination of dolomite

B. Roasting of cinnabar
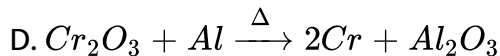
C. Zone of refining of Si

D. Leaching of gold by NaCN solution

Answer: B,D

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386. Which of the following ore do not contain iron (do not consider any impurity in ore)?

A. Pyrolusite

B. Magnetite

C. Chromite

D. Casseterite

Answer: A,D

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387. Which of the following statements are correct both calcination and roasting?

A. Both involve thermal decompoition.

B. Product of both process are porous

C. Impurities of organic compounds are removed in the forms of gas

D. Ores used are of similar type in both process

Answer: B,C

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388. Which of the following statement are correct?

A. The mineral $KCl. MgCl_2.6H_2O$ is known as carnallite.

B. The chemical composition of malachite is $CuCO_3. MgCO_3$

C. In Bayer's process of purifying aluminium ore the concentration

of ore is done with $NaOH$.

D. Silver and gold are extracted from its ore by the Mc-Arthur-Forest

cyanide process.

Answer: A,C,D

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389. Which of the following minerals do/does not contain(s) copper?

A. Siderite

B. Malachite

C. Limonite

D. Anglestite

Answer: A,C,D

390. Which of the following are the steps/reactions involved in the extraction of iron?

A. $3Fe_2O_3 + CO \xrightarrow{\Delta} 2Fe_3O_4 + CO_2$

B. $Fe_2O_4 + CO \xrightarrow{\Delta} 3FeOA + CO_2$

C. $FeO + CO \xrightarrow{\Delta} Fe + CO_2$
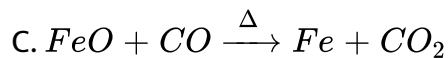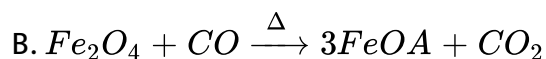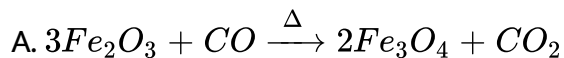
D. Calcium silicate is prouduced as slag

Answer: A,B,C,D

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391. The metal which mainluy occurs as oxide ore in nature is:

A. gold

B. lead

C. aluminium

D. magnesium

Answer: B,C

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392. On the basis of Ellingham diagram which of the following is/are correct?

A. Entropy change for all metal oxides is roughly same.

B. Below the boiling point,$T\Delta S$ factor is same irrespective of metal.

C. Above $\Delta G = 0$ line, oxide decomposes into metal and oxygen.

D. If randomness increases the slope increases.

Answer: B,C,D

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393. Complexes formed in the cyanide process are:

A. $\left[Au(CN)_2\right]^-$

B. $\left[Ag(CN)_2\right]^-$

C. $\left[Cu(CN)_4\right]^{2-}$

D. $\left[Zn(CN)_4\right]^{2-}$
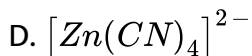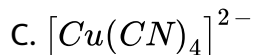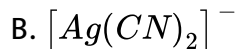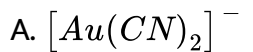
Answer: A,B,D

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394. Roasting can be performed in:

A. blast furnace

B. reveberatory furnace

C. electric furnace

D. None of these

Answer: A,B

395. In the manufacturing of metallic sodium by fused salt electrolysis method (Down's process), small amount of $CaCl_2$ that added is known as auxillary electrolyte and is used to

   A. improve the electrical conductance

   B. decrease the metling point of electrolyte

   C. stabilise the metallic sodium

   D. increases the temperature of electrolysis

Answer: A,B

396. Hoop's process of purification of aluminium involves formation of layers during electrolysis. It involves:

A. the three layers have same density but different materials.

B. the three layers have different desities.

C. the upper layer is of pure aluminium which acts as a cathode.

D. the bottom layer is of impure aluminium which acts as an anode and middle layer consists of cryolite and BaF_2.

Answer: B,C,D

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397. Metallurigical process of zinc involves roasting of zinc sulphide followed by reduction. Metallic zinc distills over as its volatile and impurities like Cu, Pd and Fe gets condensed. The crude metal obtained is called spelter, which may be purified by:

A. electrolysis process

B. fractional distillaiton

C. poling

D. heating with idone

Answer: A,B

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398. Common impurities present in bauxite are......

A. CuO

B. ZnO

C. Fe_2O_3

D. SiO_2

Answer: C,D

399. During extraction of copper, it is obtained in the form of molten matte. Which of the following is not ture?

A. Matte is further treated in Bessemer's converter

B. Molten matte is electrolysed

C. It is treated with a blast of air and sand

D. It is dissolved in $CuSiF_6$ and crystallised

Answer: B,D

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400. Which of the following employ downward movement or ore due to gravity?

A. gravity separation process

B. froth floatation

C. Blast furnace

D. Bessemer's converter

Answer: A,C

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401. The correct statemetn are:

A. Generally the calcination and roasting is done blast furnace

B. The sandy and rcoky material associated with ore are called matrix.

C. Froth floatation process is suitbale for sulphide ores.

D. Substance that reacts with gangue to form fusible mass is called slag.

Answer: B,C

---

402. Upon heating with Cu_2S the reaction (s) that give copper metal is /are

A. $CuFeS_2$

B. CuO

C. Cu_2O

D. $CuSO_4$

Answer: B,C,D

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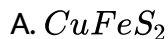
403. Copper is purified by electrolytic refining of bliter copper .The current stetement about this process is (are):

(i) impure Cu strip is used as cathode

(ii) acidified aqueous $CuSO_4$ is used as electrolyte

(iii) pure Cu deposits at eathode

(iv) impurities settle as anode -mud

    A. Impure Cu strip is used as cathode.

    B. Acidified aquesous $CuSO_4$ is used as electrolyte.

    C. Pure Cu deposits at cathode.

    D. Impurities settle as anode mud.

Answer: B,C,D

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404. Extraction of copper from copper pyrite $(CuFeS_2)$ involves

    A. crushing follwed by concentration of the ore by froth floataion

    B. removal of iron as slag.

C. self reduction step to produce 'blister copper' following evolution of SO_2

D. refining of blishter copper by carbon reduction.

Answer: A,B,C

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405. An element (X) which is the most abundant metal in the earth's crust and the third most abudant element, is extracted by the electrolysis of its fused oxide in melted cryolite and fluorspar. XCl_3 exists as $(XCl_3)_n$ in crystalline state and is only dimeric (X_2Cl_6) in fused state

$X + 3HCl + 6H_2O \rightarrow XCl_3.6H_2O(s) + \dfrac{3}{2}H_2$
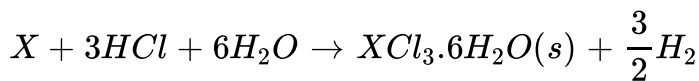
Anhydrous XCl_3 fumes in moist air and is very hygroscopic

Consider of the following is correct?
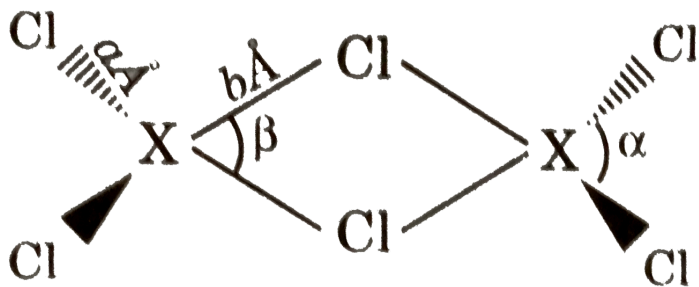
Which of the following is correct?

A. $\alpha > \beta$ and $b > a$

B. $\beta > \alpha$ and $b < a$

C. $\alpha > \beta$ and $a > b$

D. $\alpha < \beta$ and $b < a$

Answer: A

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406. $\underset{\text{sulphide ore}}{A} + NaCN \overset{\text{air}}{\Longleftrightarrow} \underset{\text{complex}}{B} + Na_2S \overset{O_2}{\longrightarrow} Na_2SO_4$
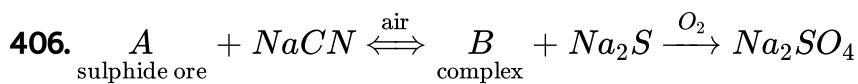
then B is:

A. Paramagnetic and octahedral complx

B. Diamagnetic of central atom is 6

C. coordination of central atom is 6

D. Complex B is $Na_2[Zn(CN)_3]$

Answer: B

407. All minerals are not ore but all ores are minerals. The extraction of a particular metal depends upon several factor and overall it has to be convenitent and economical. Following common steps are involved in extraction of metal from its prime ore:

(a) Pulverisation

(b) Concentration

(c) Calcination/Roasting

(d) Smelting and Reduction

(e) Purifaction of crude metal

Which of the following options is correct? State true and false

(P) Fe_2O_3 can be reduced by coke as well as aluminium.

(Q) Red bauxite is is concentrated by leaching method.

(R) Impure Zn is purified by either distilation or electrolytic is refining

method.

(S) Wrought iron is a purest form of iron.

   A. TTTT

   B. FTTT

   C. FTFT

   D. TFTF

Answer: A

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408. Copper is the most noble of the first row transition metals and

occurs in small deposits in several countries. Ors of copper include

chalcanthite $(CuSO_4.5H_2O)$, 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 $(CuFeS_2)$. the extraction of copper from chalcopyrite involves partial roasting, removvla of iron and self- reduction.

Partial roasting of chalcopyrite produces

A. Cu_2S and FeO

B. Cu_2O and FeO

C. Cus and Fe_2O_2

D. Cu_2O and Fe_2O_2

Answer: a

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409. Copper is the most noble of the first row transition metals and occurs in small deposits in several countries. Ors of copper include

chalcanthite $(CuSO_4.5H_2O)$, 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 $(CuFeS_2)$. the extraction of copper from chalcopyrite involves partial roasting, removvla of iron and self- reduction.

Iron is removed from chalcopyrite as

A. FeO

B. FeS

C. Fe_2O_3

D. $FeSiO_3$

Answer: d

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410. Copper is the most noble of the first row transition metals and occurs in small deposits in several countries. Ors of copper include

chalcanthite $(CuSO_4.5H_2O)$, 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 $(CuFeS_2)$. the extraction of copper from chalcopyrite involves partial roasting, removvla of iron and self- reduction.

In self- reduction, the reducing species is

A. S

B. O^{2-}

C. S^{2-}

D. SO_2

Answer: c
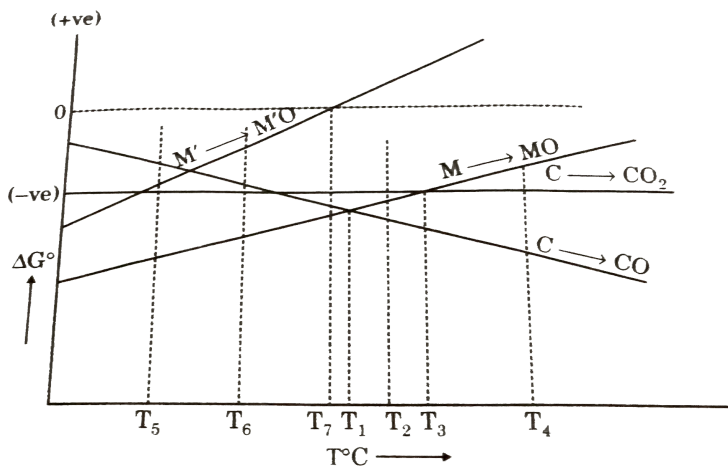
411.

In the following chemical reaction:

$$MO + C \xrightarrow{\Delta} M + CO,$$
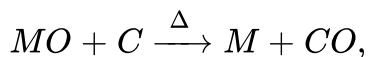
At what temperature this reaction is most feasible?

A. T_3

B. T_5

C. T_6

D. T_1

Answer: a

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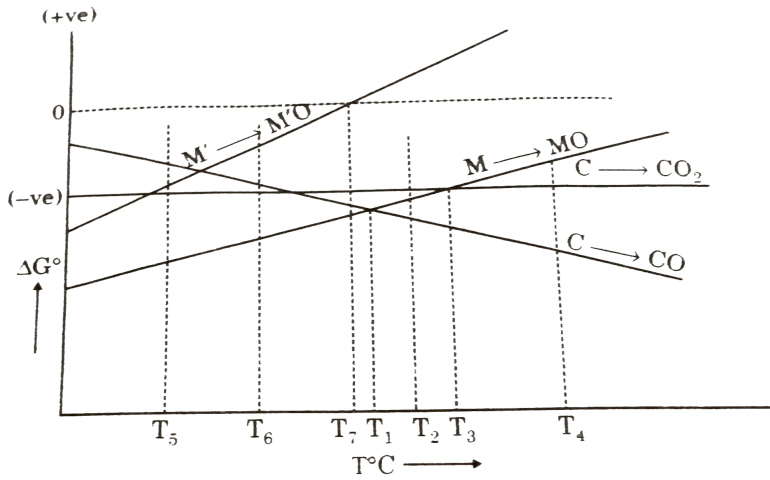
412.

In the following chemical reaction:

$$MO + C \xrightarrow{\Delta} M + CO,$$
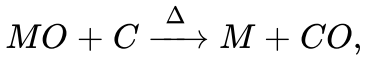
What is the decomposition temperature of $M'O$?

A. T_2

B. T_5

C. T_6

D. T_7

Answer: d

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413. $\text{Elemeta ore} \xrightarrow[\;(ii)\,\text{Filter}\;]{\text{Alkaline NaCN solution+air}} \underset{\text{Filtrate}}{X}$

$(X) \xrightarrow{\text{Metal powder}} (Y) \Big\downarrow + \underset{\text{soluble complex}}{Z}$
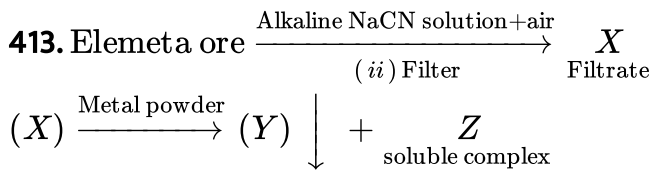
Which of the following elements is extracted by the above mentioned method?

A. Al

B. Ag

C. Zn

D. Pb

Answer: b

414. $\text{Elemeta ore} \xrightarrow[\;(ii)\,\text{Filter}\;]{\text{Alkaline NaCN solution+air}} \underset{\text{Filtrate}}{X}$

$(X) \xrightarrow{\text{Metal powder}} (Y) \Big\downarrow + \underset{\text{soluble complex}}{Z}$
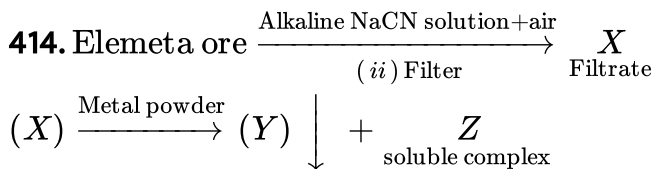
Which of the following can be used to precipitate (Y) from the filtrate (X)?

A. Zn dust

B. Al dust

C. Pt dust

D. Both a and b

Answer: d

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415. Question given below are based on the given diagram of extractive metallurgy.

The point noted by arrow are the melting and boiling points of the

metals zinc and magnesium. $\Delta G°$ as a function of temperature for

some reaction of extractive metallurgy.

At what temperature, zinc and carbon have equal affinity for oxygen?

A. $1000°C$

B. $1500°C$

C. $500°C$

D. $1200°C$

Answer: a

416. Question given below are based on the given diagram of extractive metallurgy.
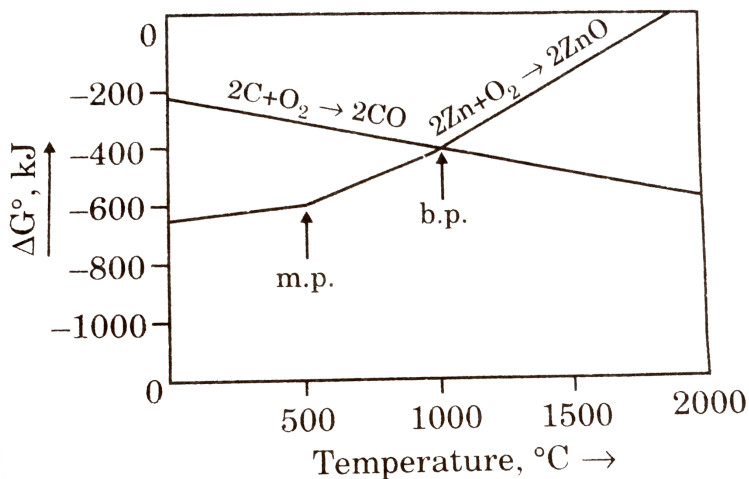
The point noted by arrow are the melting and boiling points of the metals zinc and magnesium. $\Delta G°$ as a function of temperature for some reaction of extractive metallurgy.

At this temperature $\Delta G°$ of the reaction is:

$ZnO + C \rightarrow Zn + CO$
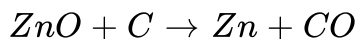
A. $- ve$

B. $+ve$

C. zero

D. nothing can be said

Answer: c

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417. Question given below are based on the given diagram of extractive metallurgy.

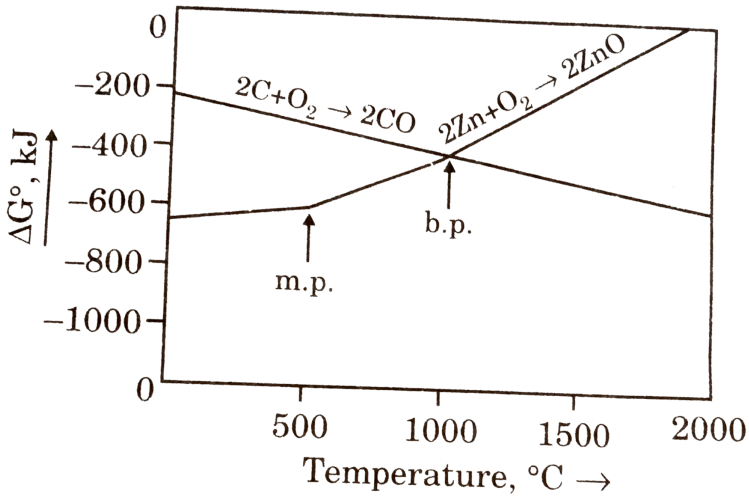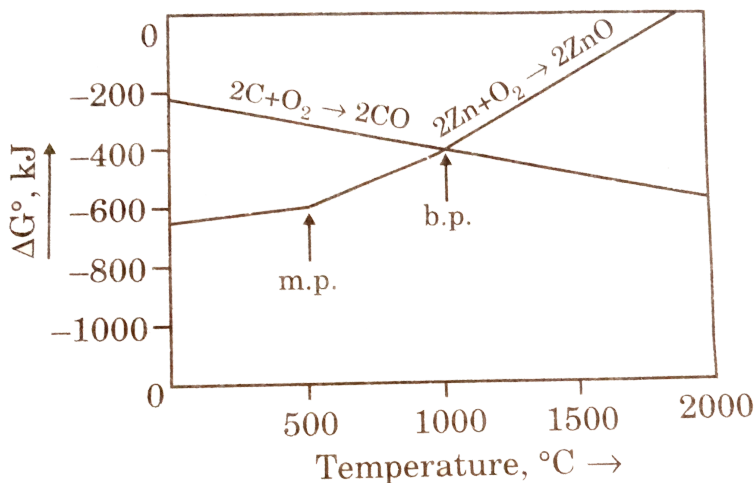The point noted by arrow are the melting and boiling points of the metals zinc and magnesium. ΔG° as a function of temperature for some reaction of extractive metallurgy.

To make the following reduction process spontaneous, temperature should be:

$$ZnO + C \rightarrow Zn + CO$$
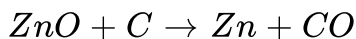
A. $< 1000^{\circ} C$

B. $> 1100^{\circ} C$

C. $> 500^{\circ} C$

D. $> 500^{\circ} C \text{but} < 1000^{\circ} C$
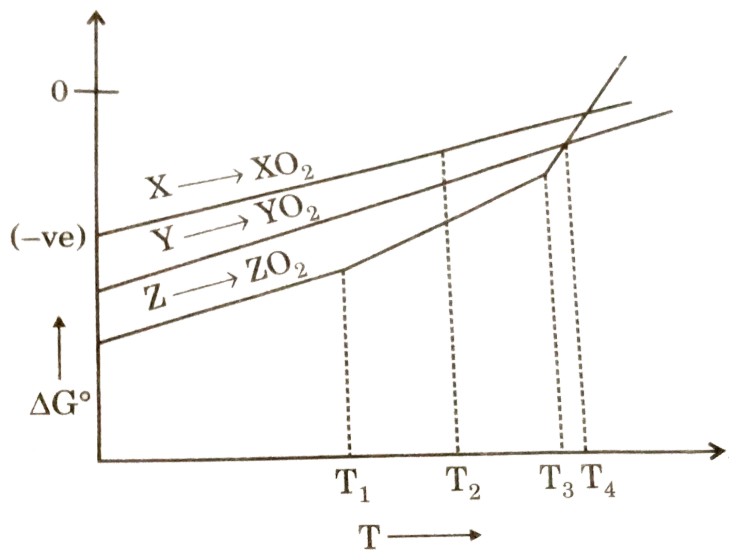
Answer: b

418.

Temperature T_1 and T_3 represents respectively: `

A. melting point and boiling point of Z

B. melting point and boiling point of ZO_2

C. melting point of Z and ZO_2

D. boiling point of Z and ZO_2

Answer: a

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419.
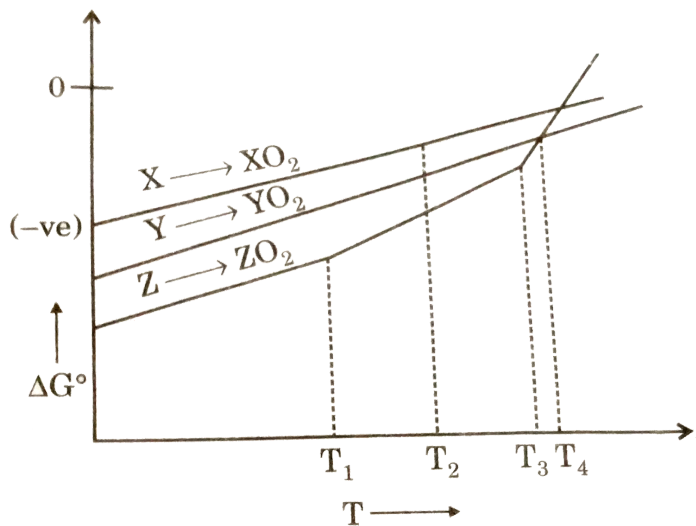
At T_2 temperture, which of the following reaction is most feasible?

A. $Z + XO_2 \rightarrow X + ZO_2$

B. $Z + YO_2 \rightarrow Y + ZO_2$

C. $X + YO_2 \rightarrow Y + XO_2$

D. $X + ZO_2 \rightarrow Z + XO_2$
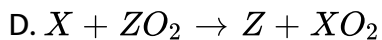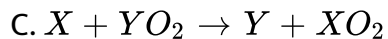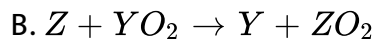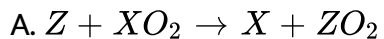
Answer: a

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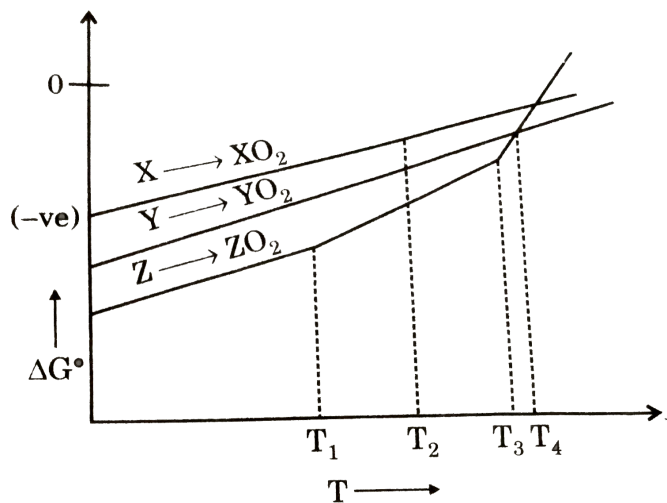
420.

At T_4 temperature, the ΔG for the reactioin $Y + ZO_2 \rightarrow Z + YO_2$ is:

A. $\Delta G = (\,+\,)$

B. $\Delta G = (\,-\,)$

C. $\Delta G = 0$

D. cannot be predicated

Answer: c

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421. Most metals are obtained from minerals. A minerals is obtained by mining and is a naturally occuring substances with a range of chemical compositon.

Which of the following metal sulphide is reduced by self reduction?

A. Cu_2S

B. PbS

C. HgS

D. All are reduced by self reduction

Answer: d

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422. Most metals are obtained from minerals. A minerals is obtained by mining and is a naturally occuring substances with a range of chemical compositon.
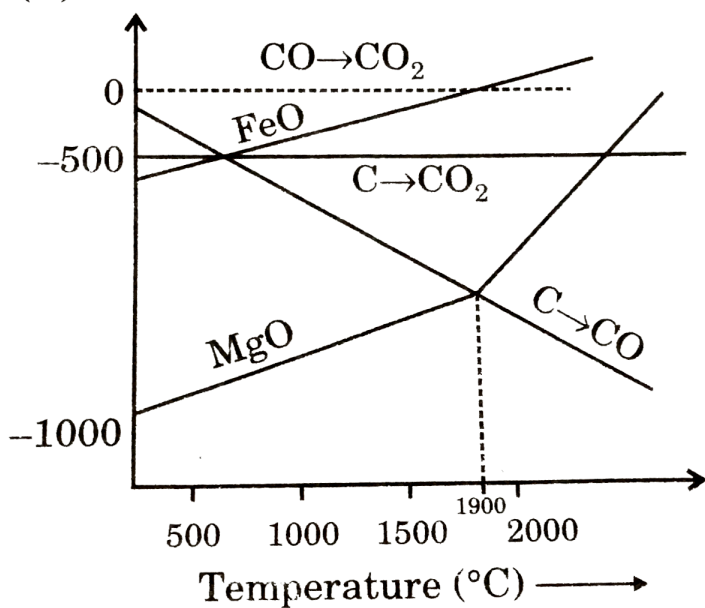
Using the Ellingham diagram, estimate the temperature at which MgO can be reduced to metal by carbon:

A. Below $1500°C$

B. Below $1120°C$

C. Above $1900°C$

D. Below $1600°C$

Answer: c

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423. Most metals are obtained from minerals. A minerals is obtained by mining and is a naturally occuring substances with a range of chemical compositon.

Which of the following method is based upon realtive melting point of ore and impurty?

    A. Bessemerisation

    B. Amalgamation

    C. Liquation

    D. Distillation

Answer: c

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424. Some of the lower quality ore are mixed with Haematite for Fe extraction like Siderate, Limonite and Magnetic. Roasted ore are mixed

with coke and lime stone, finally heated in the blast furnace to get molten Fe.

Choose the correct statement reagarding the roasting process here.

A. It is illogical because there is no sulphide ore in extraction of Fe.

B. Limonite is converted into magnetite during roasting

C. FeO is converted into Fe_2O_3

D. None of these

Answer: c

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425. Some of the lower quality ore are mixed with Haematite for Fe extraction like Siderate, Limonite and Magnetic. Roasted ore are mixed with coke and lime stone, finally heated in the blast furnace to get molten Fe.

Which of the following reaction is least favoured at the heath?

A. $SiO_2 + 2C \rightarrow Si + 2CO$

B. $SiO_2 + C \rightarrow Si + CO_2$

C. $Mn_3O_4 + 4C \rightarrow 3Mn + 4CO$

D. $Ca_3(PO_4)_2 + 3SiO_2 \rightarrow 3CaSiO_2 + P_2O_5$
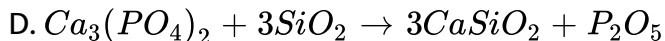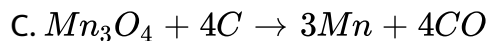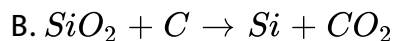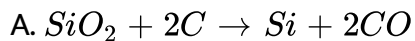
Answer: b

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426. Iron is extracted from its oxide in blast furnace. This is almost cylindrical furnace.

Which of the following slag is formed in extraction of Iron?

A. $FeSiO_3$

B. $CuCO_3$

C. $CaSiO_3$

D. $SiSiO_3$

Answer: c

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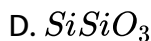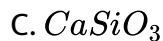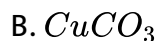
427. Which of the following metal's ore is/are concentrated by leaching method?

A. Al

B. Ag

C. Au

D. All are concentrated by leaching

Answer: d

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428. Benefication of the ore can be done by different ways. It is increasing the concentration of ore by removing impurities, while

refining is the process by which concentration of metal is incresed in the final product.

Which of the following compound will be reduced by carbon reduction?

A. Zn

B. Na

C. Cr

D. Mn

Answer: a

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429. Benefication of the ore can be done by different ways. It is increasing the concentration of ore by removing impurities, while refining is the process by which concentration of metal is incresed in the final product.

The liqation process is applicable for:

A. for high melting metals

B. for low melting metals

C. A and B both

D. None of these

Answer: b

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430. Benefication of the ore can be done by different ways. It is increasing the concentration of ore by removing impurities, while refining is the process by which concentration of metal is incresed in the final product.

What is the correct match for the name of the ore in column I and formula in column II?

A.
Name of the ore	Formula
(a)Zincite	$ZnSO_4.7H_2O$

B.
Name of the ore	Formula
(a)Malachite green	$Cu(OH)_2. CuCO_3$

	Name of the ore	Formula
C.	(a) Anglesite	$PbCO_3$
D.	Name of the ore	Formula
	(a) Magnetite	$MgCO_3$

Answer: b

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431. Benefication of the ore can be done by different ways. It is increasing the concentration of ore by removing impurities, while refining is the process by which concentration of metal is incresed in the final product.

The phase principle to apply vapour phase refining is/are:

A. The intermediate compound has to be volatile

B. The intermediate compound has to be relatively thermally unstable.

C. a and b both

D. Neither a nor b

Answer: c

432. Metallic gold ferquently is found is aluminosilicate rocks and it is finely dispersed among other minerals. It may be extracted by treating the crushed rock with aearated sodium cyanide solution. During this process metallic gold is slowly converted to $\left[Au(CN)_2\right]^-$, Which is soluble in water. After equilibrium has been reached, the aqueous phase is pumped off and the metallic gold is recoverd form it by reacting the gold complex with zinc, whihc is converted tio $\left[Zn(CN)_4\right]^{2-}$. Gold in nature is frequently alloyed with silver. which is also oxidised vy aerated sodium by aerated sodium cyanide solution. The correct ionic reaction for the process are:

A. $4Au + 8CN^- + 2H_2O + O_2(air)$

    " " 4 [Au(CN)_(2)]^(-)("soluble")+4OH^(-)

B. $Au + 2CN^- \rightarrow Au\left[(CN)_2\right]^-$

C. $Zn + 2CN^- \rightarrow Zn[(CN)_2]^-$

D. $Zn + 4CN^- \rightarrow Zn[(CN)_2 - (4)]^{2-}$
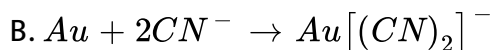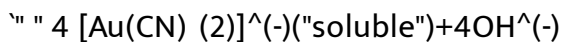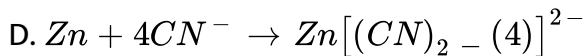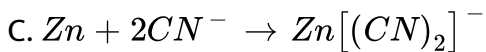
Answer: a

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433. Metallic gold ferquently is found is aluminosilicate rocks and it is finely dispersed among other minerals. It may be extracted by treating the crushed rock with aearated sodium cyanide solution. During this process metallic gold is slowly converted to $[Au(CN)_2]^-$, Which is soluble in water. After equilibrium has been reached, the aqueous phase is pumped off and the metallic gold is recoverd form it by reacting the gold complex with zinc, whihc is converted tio $[Zn(CN)_4]^{2-}$. Gold in nature is frequently alloyed with silver. which is also oxidised vy aerated sodium by aerated sodium cyanide solution There have been several to develop alternative gold extraction processs whihc could replace this one. This due to:

A. Sodium cyanide solutions corrode mining machinery.

B. Sodium cyanide escapes into ground water and produces

hydrogen cyanide which is toxic.

C. Gold obtained by this process is not pure.

D. The amount of gold in aluminosilicate rocks is very less.

Answer: b

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434. Metallic gold ferquently is found is aluminosilicate rocks and it is finely dispersed among other minerals. It may be extracted by treating the crushed rock with aearated sodium cyanide solution. During this process metallic gold is slowly converted to $\left[Au(CN)_2\right]^-$, Which is soluble in water. After equilibrium has been reached, the aqueous phase is pumped off and the metallic gold is recoverd form it by reacting the gold complex with zinc, whihc is converted tio

$\left[Zn(CN)_4\right]^{2-}$. Gold in nature is frequently alloyed with silver. which is also oxidised vy aerated sodium by aerated sodium cyanide solution

The process described in the passage represents:

A. ore concentration

B. pyrometallurgical extraction

C. hydrometallurgical extraction

D. purification of metal

Answer: c

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435. Amongst the various ores of a metal (M) (sulphide, carbonates, oxides, hydrated or hydrixides) two ores [X] and [Y] show the following reactivity?

(a) [X[] on calcination gives a black solid (S), water and a colourless gas which produces milkiness when passed through lime water. But this

colourless gas does not decolorise acidified $KMnO_4$.

(b) [X] dissolved in diliute HCl. On reaction with KI gives a white precipitate(P) and iodine gas.

(c) [Y] on roasting at high temperature gives metal (M) and gas (G_1) which turns starch iodate solution blue.

(d) [Y] on reaction with dilute HCl gives a white precipatate (MS) and another gas (G_1) to precipitate colloidal sulpher in presence of moisture.

M,S[X],[Y] gives greenish blue flame.

The metal ore [X] and [Y] are respectively:

   A. carbonate and sulphide ores

   B. sulphide and carbonate ores

   C. carbonate and hydroxide ores

   D. carbonate and oxide ores

Answer: a

436. Amongst the various ores of a metal (M) (sulphide, carbonates, oxides, hydrated or hydrixides) two ores [X] and [Y] show the following reactivity?

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(d) [Y] on reaction with dilute HCl gives a white precipatate (MS) and another gas (G_1) to precipitate colloidal sulpher in presence of moisture.

M,S[X],[Y] gives greenish blue flame.

Which of the following statements is correct about [Y]?

    A. [Y] is converted to metal (M) by self reduction.

B. Carbon extract of [Y] gives yellow precipitate with suspension of

$CdCO_3$.

C. [Y] is copper glance or copper pyrite.

D. All of the above

Answer: d

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437. Amongst the various ores of a metal (M) (sulphide, carbonates, oxides, hydrated or hydrixides) two ores [X] and [Y] show the following reactivity?

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(d) [Y] on reaction with dilute HCl gives a white precipatate (MS) and another gas (G_1) to precipitate colloidal sulpher in presence of moisture.

M,S[X],[Y] gives greenish blue flame.

The gas (G_1) can act as:

A. oxidising agent

B. reducing agent

C. oxidising agent reducing agent

D. fluxing agent

Answer: c

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438. Dow's process f extraction of Mg involves extraction of Mg from sea water. Sea water is concentrated is sun light and is then treated

with milk of lime. Magnesium hydroxide obatained is reacted with dilute HCl and $MgCl_2$ thus obtained is crystallised. The molten mixture containing angydrous 35% $MgCl_2$, 50% NaCl and 15% $CaCl_2$ is electrolysed when magnesium is discharged at cathode. NaCl and CaC_2 are added to lower the fusion temperature and to increase to the conductance. Mg electrolysed is protected from atmospheric oxidation by a blanket of inert gases.

Select the correct statement.

A. Langbenite contains potassium and magnesium.

B. Hydrated magnessium chloride is made anhydrous by heating in

presence of dry HCl gas.

C. Fused angydrous carnallite on electrolysis liberates magnesium

at cathode.

D. All of the above

Answer: d

▶ **View Text Solution**

439. Dow's process of extraction of Mg involves extraction of Mg from sea water. Sea water is concentrated in sun-light and is then treated with slaked lime. Magnesium hydroxide is heated in a stream of HCl to give $MgCl_2$ which is electrolysed to discharge Mg. The mixture is in the ratio 35% $MgCl_2 + 50\% \ NaCl + 15\% \ CaCl_2$. NaCl and $CaCl_2$ are added to lower the fusion temperature and to increases the conductance.

$Mg^{2+} + Ca(OH)_2 \rightarrow Mg(OH)_2 + Ca^{2+}$

$Mg(OH)_2 + 2HCl \rightarrow MgCl_2 + 2H_2O(l)$
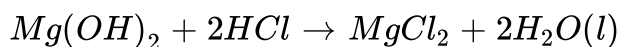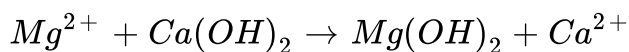
Electrolysis of fused $MgCl_2 \Leftrightarrow Mg^{2+} + 2Cl$

$Mg^{2+} + 2e^- \rightarrow Mg($ At Cathode$)$

$2Cl^- \rightarrow Cl_2 + 2e^-$ (At Anode)
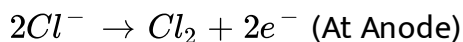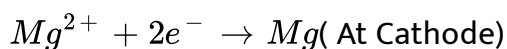
Mg electrolysed is protected from atmospheric oxidation by a blanket of inert gases.

In the hydrated chloride of Mg the value of x is :

A. 6

B. 4

C. 2

D. 10

Answer: a

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440. Dow's process f extraction of Mg involves extraction of Mg from sea water. Sea water is concentrated is sun light and is then treated with milk of lime. Magnesium hydroxide obatained is reacted with dilute HCl and $MgCl_2$ thus obtained is crystallised. The molten mixture containing angydrous 35% $MgCl_2$, 50% NaCl and 15% $CaCl_2$ is electrolysed when magnesium is discharged at cathode. NaCl and CaC_2 are added to lower the fusion temperature and to increase to the conductance. Mg electrolysed is protected from atmospheric oxidation by a blanket of inert gases.

Molten mixture of NaCl and $CaCl_2$ is added to hte molten $MgCl_2$ beacuse:

A. it increase the melting point of $MgCl_2$.

B. $CaCl_2$ acts as a dehydrating agent.

C. $CaCl + NaCl$ lower the melting point of $MgCl_2$.

D. none of these

Answer: c

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441. Following flow diagram represents the extraction of aluminium from bauxite,
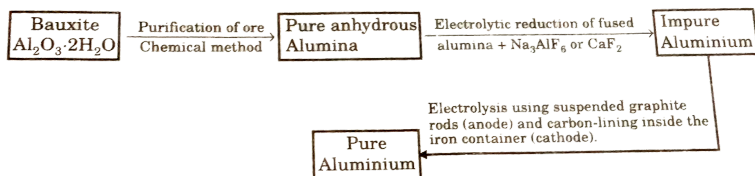
The pure of adding cryolite is:

A. to increase the electrical conductivity of pure aluminium

B. to lower the melting point of Al_2O_3.

C. to remove the impurities of Al_2O_3.

D. to increase the aluminium percentage in the yield.

Answer: b

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442. Following flow diagram represents the extraction of aluminium from bauxite,
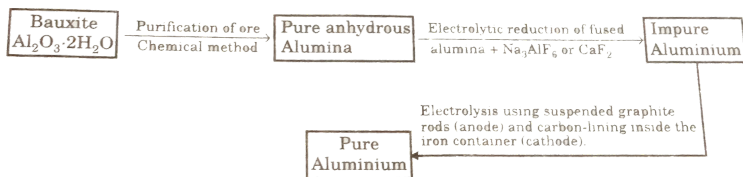
Coke powder is spreaded over the molten electrolyte to:

A. prevent the loss of heat by rediation from the surface.

B. prevent the corrosion of graphite anode.

C. prevent oxidation of molten aluminium by air.

D. both a and c

Answer: d

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443. Following flow diagram represents the extraction of aluminium from bauxite,

| Bauxite $Al_2O_3 \cdot 2H_2O$ | $\xrightarrow[\text{Chemical method}]{\text{Purification of ore}}$ | Pure anhydrous Alumina | $\xrightarrow{\text{Electrolytic reduction of fused}}$ alumina + Na_3AlF_6 or CaF_2 | Impure Aluminium |

Electrolysis using suspended graphite rods (anode) and carbon-lining inside the iron container (cathode).
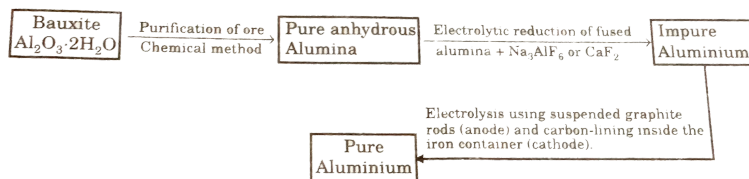
| Pure Aluminium |

Select the incorrect statement.

A. Bauxite is purified by Hall's Serpeck's and Bayer's process.

B. In the electrochemical process for aluminium extraction, a molten

of Al_2O_3, Na_3AlF_6 or $CaF_2 is used ase \leq ctrolyte.$

C. Hydroted alumia is converted to anhydrous alumina by calcination process.

D. None of these

Answer: d

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444. Read the following graph and answer the following question
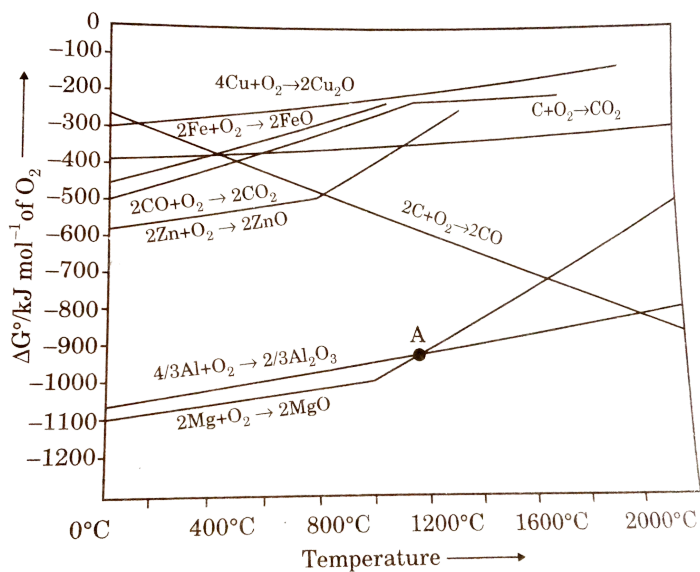
At what approximately temperature, zinc and carbon have affinity for oxygen?

A. $1000°C$

B. $1500°C$

C. $500°C$

D. $1200°C$

Answer: a

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445. Read the following graph and answer the following question
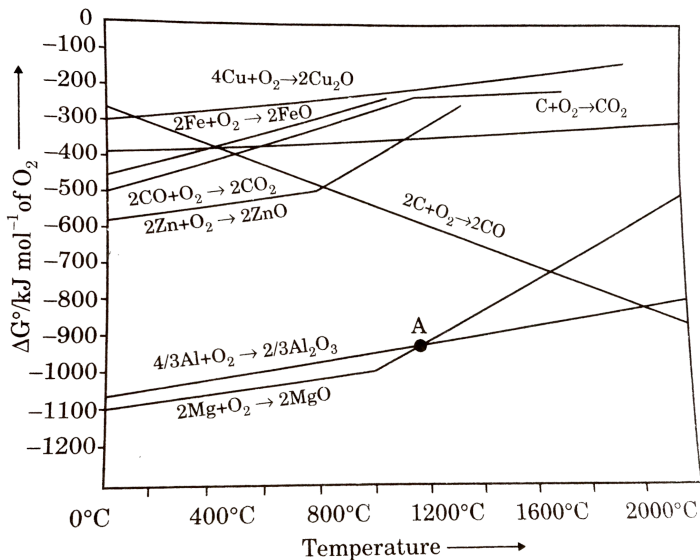
To make the following reduction process spontaneous, temperature should be:

A. $< 1000°C$

B. $< 1000°C$

C. $< 500°C$

D. $> 500°C$ but $< 1000°C$

Answer: b

446. Read the following graph and answer the following question
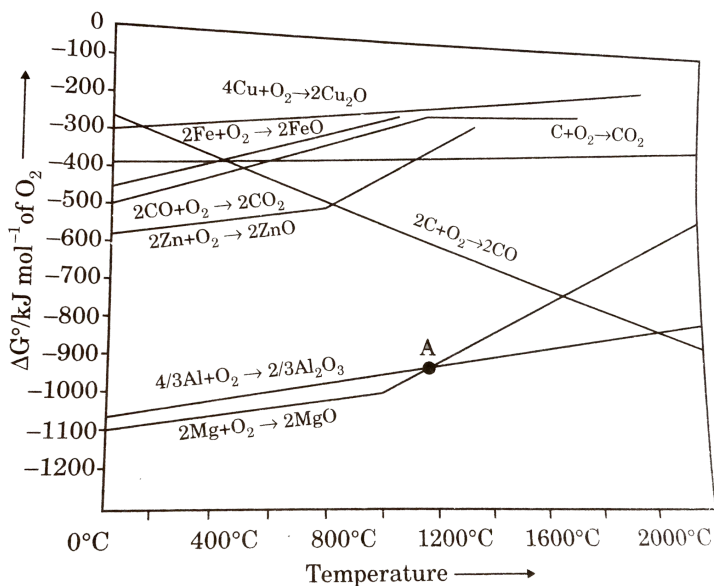
Which of the following statement is true?

447. The first stage in the conversion of iron ore to steel is the carbon

reduction in blast furnace, which accounts for the largest tonnage of

any metal produced by man. In it the iron ore is redcued by CO/coke while limestone removes by sand or clay as slag. The molten iron is run off to be cast into moulds of the required shape or into ingouts ("pigs") for further processing.

Select the correct for the % of carbon in different form if iron.

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448. The first stage in the conversion of iron ore to steel is the carbon reduction in blast furnace, which accounts for the largest tonnage of any metal produced by man. In it the iron ore is redcued by CO/coke while limestone removes by sand or clay as slag. The molten iron is run off to be cast into moulds of the required shape or into ingouts ("pigs") for further processing.

Select incorrect option:

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449.

| Sulphide | → | A | → | Oxide | → | B | → | Impure metal | → | C | → | Pure metal |
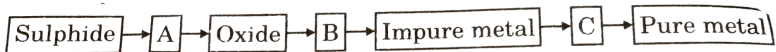
Step C (refining) involved in purification of Pb metal:

450.

| Sulphide | → | A | → | Oxide | → | B | → | Impure metal | → | C | → | Pure metal |
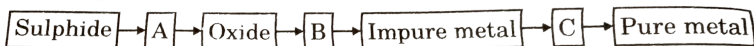
Which of the following metals are obtained by auto reduction method?

451. At high temperature carbon reacts with water to prodcue a mixture of carbon monoxide, CO and hydrogen, H_2.

$$C + H_2O \xrightarrow{\text{red heat}} CO + H_2$$
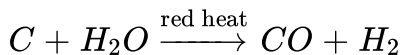
CO is separted from H_2 and then used to separtee nickel from cobalt by forming a volatile compound, nickel tetracarbonyl, $Ni(CO_-(3))$

$$Ni + 4CO \rightarrow Ni(CO)_4$$
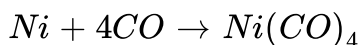
How many moles of $Ni(CO)_4$ could be obatined from the CO produced by the reaction of 75g of carbon? Assume 100% reaction and 100% recovery in both steps.

452. At high temperature carbon reacts with water to prodcue a mixture of carbon monoxide, CO and hydrogen, H_2.

$$C + H_2O \xrightarrow{\text{red heat}} CO + H_2$$
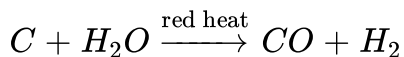
CO is separted from H_2 and then used to separtee nickel from cobalt by forming a volatile compound, nickel tetracarbonyl, $Ni(CO\_(3))$

$$Ni + 4CO \rightarrow Ni(CO)_4$$
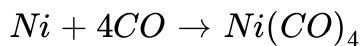
Formation of volatile $Ni(CO)_4$ and its subsquent heating give Ni. Process is called:

A. self reduction

B. van arkel process

C. elctrochemical refining

D. mond's proces

Answer: d

453. Match the following columns

Column-I		Column-II	
(a)	Zincite	(p)	Zinc ore
(b)	Argentite	(q)	Sulphide ore
(c)	Pyrolusite	(r)	Oxide ore
(d)	Sphalerite	(s)	Silver ore
		(t)	Manganese ore

Column-I	Column-II
(a) $Cu_2S + CuO \longrightarrow ?$	(p) Crude metal is obtained
(b) $Cu_2S + CuSO_4 \longrightarrow ?$	(q) Sulphide acts as reducing agent

454.

(c) $Cu_2S + Cu_2O \longrightarrow ?$	(r)	Smelting is involved in the extraction of metal.
(d) $PbSO_4 + PbS \longrightarrow ?$	(s)	SO_2 is formed as by product.
	(t)	Self-reduction is involved.

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455. Match the following columns

Column-I (Ore)		Column-II (Properties)
(a) Calamine	(p)	Concentrate by froth floatation method
(b) Carnalite	(q)	Ore of Mg
(c) Epsom salt	(r)	Ore of Zn
(d) Galena	(s)	Ore of Pb
	(t)	Carbonate ore

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456. Match the following columns

Column-I		Column-II	
(a)	Self reduction	(p)	Lead
(b)	Carbon reduction	(q)	Silver
(c)	Complex formation and displacement by metal	(r)	Copper
(d)	Decomposition of iodide	(s)	Boron

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457. Match the following columns

Column-I		Column-II	
(a)	$PbS \longrightarrow PbO$	(p)	Roasting
(b)	$CaCO_3 \longrightarrow CaO$	(q)	Calcination
(c)	$ZnS \longrightarrow Zn$	(r)	Carbon reduction
(d)	$Cu_2S \longrightarrow Cu$	(s)	Self reduction

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458. Match the following columns

Column-I	Column-II
(a) Cyanide process	(p) Ultra pure Ge
(b) Froth floatation process	(q) Pine oil
(c) Electrolytic reduction	(r) Extraction of Al
(d) Zone refining	(s) Extraction of Au

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459. Match the following columns

Column-I	Column-II
(a) Limonite	(p) Carbonate ore
(b) Argentite	(q) Halide ore
(c) Carnallite	(r) Sulphide ore
(d) Calamine	(s) Oxide ore

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460. Match the following columns

Column-I	Column-II
(A) Leaching	(p) Copper pyrite
(B) Calcination	(q) Siderite
(C) Froth floatation	(r) Bauxite
(D) Magnetic separation	(s) Chromite

461. Match the following columns

Column-I	Column-II
(A) Self reduction	(p) Copper from copper glance
(B) Carbon and carbon monoxide reduction	(q) Silver from argentite
(c) Electrolytic reduction in fused state	(r) Aluminium
(D) Complex formation and displacement by metal	(s) Chromite

462. Match the following columns

Column-I	Column-II
(a) Cuprite	(p) Sulphate ore
(b) Cerussite	(q) Carbonate ore
(c) Carnallite	(r) Oxide ore
(d) Epsomite	(s) Chloride ore

463. Match the following columns

Column-I	Column-II
(a) Haematite	(p) Slag formation during roasting/smelting and bessemerisation.
(b) Copper pyrites	(q) Reduction by carbon monoxide/carbon at different temperatures.
(c) Carnallite	(r) Electrolytic reduction
(d) Bauxite	(s) Calcination

464. Match the following columns

Column-I (Metal)		Column-II (Process)	
(a)	Tin (from cassiterite)	(p)	Roasting
(b)	Zinc (from zinc blende)	(q)	Carbon reduction
(c)	Silver (from native ore)	(r)	Leaching
(d)	Lead (from galena)	(s)	Magnetic separation

Column-I		Column-II	
(a)	Chalcopyrites	(p)	Self-reduction
(b)	Galena	(q)	Sulphurised ore
(c)	Argentite	(r)	Carbon reduction
(d)	Malachite	(s)	Leaching followed by displacement method
		(t)	Acidic flux

465.

Column-I		Column-II	
(a)	Slag formation	(p)	Extraction of copper from copper pyrites.
(b)	Froth-floatation	(q)	Extraction of aluminium from bauxite.
(c)	Leaching	(r)	Extraction of iron from haematite.
(d)	Roasting	(s)	Extraction of tin from cassiterite.
		(t)	Extraction of lead from galena.

466.

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467. Match the following columns

Column-I		Column-II		Column-III	
(a)	Carnallite	(p)	Sulphide ore	(w)	Cyanide process
(b)	Argentite	(q)	Oxide ore	(x)	Carbon reduction
(c)	Siderite	(r)	Halide ore	(y)	Self-reduction
(d)	Cerrusite	(s)	Carbonate ore	(z)	Electrolytic reduction

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Column-I		Column-II	
(a)	Hall-Heroult process	(p)	Molten Al_2O_3 + Na_2AlF_6 electrolysis
(b)	Dow's sea water process	(q)	Molten $MgCl_2$ + $CaCl_2$ + NaCl electrolysis
(c)	Hoopes process	(r)	Molten impure aluminium + fluorides of Na^+, Ba^{2+} and Al^{3+} electrolysis
(d)	Mc-Arthur Forrest process	(s)	Complex formation and displacement method

468.

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469. Match the following columns

Column-I		Column-II	
(a)	Limonite, Cuprite	(p)	Sulphate ore
(b)	Calamine, Cerussite	(q)	Carbonate ore
(c)	Pyragyrite, Zinc blende	(r)	Oxide ore
(d)	Anglesite, Langbeinite	(s)	Sulphide ore

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470. Match the following columns

Column-I (Reactions)		Column-II (Processes)
(a)	$4Au + 8NaCN + 2H_2O + O_2 \xrightarrow{\Delta} 4Na[Au(CN)_2] + 4NaOH$	(p) Leaching
(b)	$CuFeS_2 + 2H_2SO_4 \xrightarrow{\Delta} CuSO_4 + FeSO_4 + 2H_2S$	(q) Smelting
(c)	$CaO + SiO_2 \xrightarrow{\Delta} CaSiO_3$	(r) Hydrometallurgy
(d)	$MgCl_2 \cdot 6H_2O \xrightarrow{\Delta} MgCl_2 + 6H_2O$	(s) Calcination

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471. Match the following columns

Column-I (Reaction)		Column-II (Processes)
(a)	$FeO + SiO_2 \longrightarrow FeSiO_3$	(p) Calcination
(b)	$3Mn_3O_4 + 8Al \xrightarrow{\Delta} 4Al_2O_3 + 9Mn$	(q) Displacement method
(c)	$Cu_2S + 2Cu_2O \xrightarrow{\Delta} 6Cu + SO_2$	(r) Smelting
(d)	$2Al(OH)_3 \xrightarrow{\Delta} Al_2O_3 + 3H_2O$	(s) Thermite process
(e)	$2Na[Ag(CN)_2] + Zn \xrightarrow{\Delta} Na_2[Zn(CN)_4] + 2Ag$	(t) Bessemerisation

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472. Match the following columns

Column-I	Column-II
(a) Poling	(p) Titanium
(b) Cupellation	(q) Copper
(c) Liquation	(r) Silver
(d) Van Arkel method	(s) Tin

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473. Match the following columns

Column-I		Column-II
(a)	Pb	(p) Bessemerisation
(b)	Cu	(q) Roasting
(c)	Zn	(r) Pyrometallurgy
(d)	Fe (pig iron)	(s) Self-reduction method

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474. Match the following columns

Column-I (Metals)		Column-II (Ores)	
(a)	Tin	(p)	Calamine
(b)	Zinc	(q)	Cassiterite
(c)	Iron	(r)	Cerrusite
(d)	Lead	(s)	Siderite

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475. Match the following columns

Column-I (Ore)		Column-II (Metal)	
(a)	Carnallite	(p)	Zinc
(b)	Calamine	(q)	Titanium
(c)	Ilmenite	(r)	Magnesium
(d)	Chalcopyrite	(s)	Copper

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Column-I		Column-II	
(a)	Fe(from oxide ore)	(p)	Roasting
(b)	Cu(from sulphide ore)	(q)	Self reduction
(c)	Pb (from sulphide ore)	(r)	CO act as principle reducing agent
(d)	Al(from oxide ore)	(s)	Amphoteric nature is used during leaching
		(t)	Smelting

476.

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477. Match the following columns

Column-I (Metal)		Column-II	
(a)	Aluminium	(p)	Blast furance
(b)	Iron	(q)	Mond's process
(c)	Nickel	(r)	Bayer's process
(d)	Copper	(s)	Cyanide process
		(t)	Froth floatation

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478. Match the following columns

Column-I (Metals)		Column-II (Ores)	
(a)	Tin	(p)	Calamine
(b)	Zincb	(q)	Cassiterite
(c)	Titanium	(r)	Cerrusite
(d)	Lead	(s)	Rutile

479.

Column-I (Ore)		Column-II (Metal in Ore)	
(a)	Ilmenite	(p)	Iron
(b)	Dolomite	(q)	Magnesium
(c)	Carnallite	(r)	Potassium
(d)	Chromite	(s)	Titanium

480. Match the following columns

Column-I (Conversion processes)		Column-II (Involves which of the following operation/s)	
(a)	Auriferrous rock ⟶ Au	(p)	Roasting (separately)
(b)	Haemetite containing siderite and magnetite ⟶ Fe	(q)	Smelting
(c)	Bauxite ⟶ Al	(r)	Leaching
(d)	Galena ⟶ Pb (by self reduction)	(s)	Electrolytic reduction
		(t)	Froth floatation

481. Match the following columns

Column-I		Column-II	
(a)	$C + CO_2 \longrightarrow CO_2$	(p)	$\approx 1000°$ C
(b)	$FeO + CO \longrightarrow Fe + CO_2$	(q)	$\approx 800°$ C
(c)	$CaO + SiO_2 \longrightarrow CaSiO_3$	(r)	$\approx 1800°$ C
(d)	$Fe_3O_4 + 4CO \longrightarrow 3Fe + 4CO_2$	(s)	$\approx 400°$ C

482. Match the following columns

	Column-I		Column-II
(a)	Bessemerisation	(p)	Ti
(b)	Van Arkel method	(q)	Cast iron
(c)	Carbon reduction	(r)	Sn
(d)	Cupellation	(s	Ag

483. Match the following columns

	Column-I		Column-II
(a)	Cr	(p)	Sapphire
(b)	Co	(q)	Ruby
(c)	Al	(r)	Haemoglobin
(d)	Fe	(s)	Corundum

484. Match the following columns

Column-I (Metal)	Column-II (Procedure of extraction)
(a) Iron	(p) Carbon reduction method
(b) Lead (high grade ore)	(q) Self reduction
(c) Copper (low grade ore)	(r) Thermite process
(d) Chromium	(s) Hydrometallurgical process

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485. Match the following columns

Column-I	Column-II (Process involved to get conversion given in the column-I)
(a) $Cu_2S \longrightarrow Cu_2O$	(p) Roasting
(b) $CaCO_3 \longrightarrow CaO$	(q) Calcination
(c) $ZnS \longrightarrow Zn$	(r) Carbon reduction
(d) $PbS \longrightarrow Pb$	(s) Self reduction

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486. Match the following columns

Column-I (Metals)		Column-II (Method used for refining)	
(a)	Iron and copper	(p)	Poling
(b)	Zirconium and titanium	(q)	Bessemerisation
(c)	Lead and tin	(r)	Van-Arkel
(d)	Copper and tin	(s)	Liquation

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487. Match the following columns

Column-I		Column-II	
(a)	Concentration method based on the amphoteric nature of ore.	(p)	Pig iron
(b)	Extraction of Al from molten alumina	(q)	Hall-Heroult process
(c)	Obtained from blast furnace	(r)	Baeyer's process

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488. Match the Column-I to Column-II :

Column-I		Column-II	
(a)	Colemanite	(p)	Carbonate and hydroxide ore
(b)	Chalcocite	(q)	Halide ore
(c	Fluorspar	(r)	Sulphide ore
(d)	Azurite	(s)	Oxide ore

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489. Match the following columns

Column-I (Process)		Column-II (Metal)	
(a)	Bessemerisation	(p)	Pb
(b)	Electrolytic reduction /refining method	(q)	Cu
(c)	Carbon reduction	(r)	Zn
(d)	Cupellation	(s)	Mg
		(t)	Ag

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Column-I (Chemical change during metallurgy) (Here, M may represent any metal for any option)	Column-II (Purpose in metallurgy of specified metal)
(a) $M_2O_3 + C$ +Electrical energy $\longrightarrow M + CO/CO_2$	(p) Purification of copper
(b) $(M + Co + Fe) + CO \xrightarrow[50°C]{\lambda}$ $Fe(s) + Co(s) + \begin{bmatrix} \text{vapours of} \\ \text{carbonyl} \\ \text{complex of M} \end{bmatrix}$	(q) Benefication of bauxite
(c) $(Fe_2O_3, M_2O_3)(s) + OH^-_{(aq)}$ $\longrightarrow Fe_2O_3(s) + [M(OH_4)]^-$ sol.	(r) Extraction of metal from alumina
(d) $(Fe, M, Ag, Au) + $ Electrolytic oxidation $\xrightarrow[\text{of metal (M) salt}]{\text{in aq. solution}}$ $Fe^{+2}_{aq} + M^{+2}_{aq} + Ag(s) + Au(s)$	(s) Separation of nickel from impurities

490.

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491. Match the following columns

Column-I		Column-II	
(a)	Smithsonite	(p)	Iron
(b)	Carnallite	(q)	Copper
(c)	Azurite	(r)	Magnesium
(d)	Limonite	(s)	Zinc

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492. Match the following columns

	Column-I		Column-II
(a)	Zinc from $ZnCO_3$	(p)	Calcination
(b)	Lead from PbS	(q)	Removal of iron
(c)	Cu from $CuFeS_2$	(r)	Froth floatation process
(d)	Tin from cassiterite	(s)	Poling

493. Match the following columns

	Column-I (Process)		Column-II (Electrolyte)
(a)	Down's cell	(p)	Fused $MgCl_2$
(b)	Dow's sea wuter process	(q)	Fused $(Al_2O_3 + Na_3AlF_6 + CaF_2)$
(c)	Hall-Heroult	(r)	Fused $(40\% \ NaCl + 60\% \ CaCl_2)$
		(s)	$(AlN + C + N_2)$

494. Match the following columns

Column-I (Property)	Column-II (Element/compund)
(a) Explosive	(p) Cu
(b) Self-reduction	(q) Fe_3O_4
(c) Ferrimagnetic material	(r) $Cu(CH_3COO)_2 \cdot Cu(OH)_2$
(d) Verdigris	(s) $Pb(NO_3)_2$

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495. Match the following columns

Column-I	Column-II
(a) Blistered Cu	(p) Aluminium
(b) Blast furnace	(q) $2Cu_2O + Cu_2S \rightarrow 6Cu + SO_2$
(c) Reverberatory furnace	(r) Iron
(d) Hall-Heroult process	(s) $FeO + SiO_2 \rightarrow FeSiO_3$
	(t) $2Cu_2S + 3O_2 \rightarrow 2Cu_2O + 2SO_2$

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496. In order to obtain metal from its oxide through Blast furnace process, the following reactions are involved.

$$Fe_2O_3 + CO \rightarrow Fe_3O_4 + CO_2$$

$$Fe_3O_4 + CO \rightarrow Fe + CO_2$$

$$FeO + CO \rightarrow Fe + CO_2$$
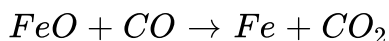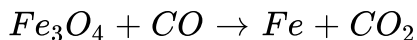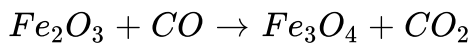
If the % yield of the first, second and third reactions are 80% and 60% ,50% respectively then calculate mass of iron (in gm) which will be obtained if 16g of Fe_2O_3 is reacted with excess of CO.

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497. The number of correctly matched pairs are:

(a) Van Arkel method-Zirconium

(b) Mond's process-Titanium

(c) Froth floatation method-Cerussite

(d) Poling process-Copper

(f) Amalgamation-Gold

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498. In order to concentrate galena (which contains ZnS as impurity) by froth floatation process, sodium cyanide is used as department. NaCN dissolves ZnS due to formation of water soluble complex (A).

Find wxyz,

Where w=corrdination number of central metal ion in complex ion of (A)

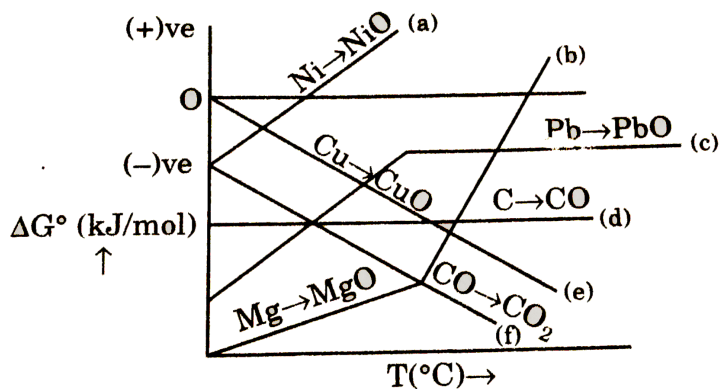x=number of unpaired electrons in (A)

y=total number of possible linkage isomers of (A) including (A)

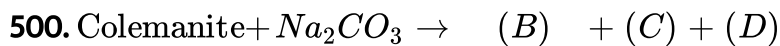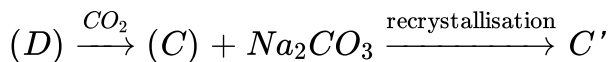z=maximum number of atoms in a single plane in the complex ion of (A).

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499. Find the number of curves which are wrongly presented in the Elingham diagran.

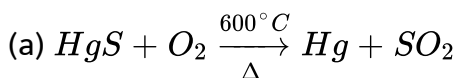Ellingham diagram with labeled lines: $Ni \rightarrow NiO$ (a), (b), $Pb \rightarrow PbO$ (c), $Cu \rightarrow CuO$, $C \rightarrow CO$ (d), $Mg \rightarrow MgO$, $CO \rightarrow CO_2$ (e), (f). Axes: ΔG° (kJ/mol) ↑, T(°C)→, with (+)ve above O and (−)ve below.

500. $\text{Colemanite} + Na_2CO_3 \rightarrow \underset{\text{White ppt.}}{(B)} + (C) + (D)$

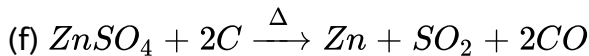$(D) \xrightarrow{CO_2} (C) + Na_2CO_3 \xrightarrow{\text{recrystallisation}} C'$
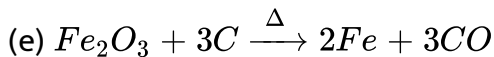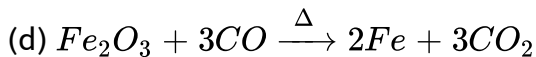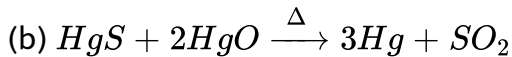
C' has only 8 water molecules of crystallisation Number of sp^3 hybrised atoms in compound C'.

501. Find the total number of feasible reaction which would yeild free metal.

(a) $HgS + O_2 \xrightarrow[\Delta]{600^\circ C} Hg + SO_2$

(b) $HgS + 2HgO \xrightarrow{\Delta} 3Hg + SO_2$

(c) $CuSO_4 + 3CO \rightarrow 3Cu + 2SO_2$

(d) $Fe_2O_3 + 3CO \xrightarrow{\Delta} 2Fe + 3CO_2$

(e) $Fe_2O_3 + 3C \xrightarrow{\Delta} 2Fe + 3CO$

(f) $ZnSO_4 + 2C \xrightarrow{\Delta} Zn + SO_2 + 2CO$

(g) $4Cu_2O + CH_4 \rightarrow 8Cu + 2H_2O + CO_2$

(h) $2Na\big[Au(CN)_2\big] + Zn \rightarrow Na_2\big[Zn(CN)_4\big] + 2Au$
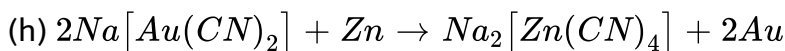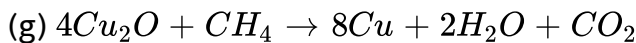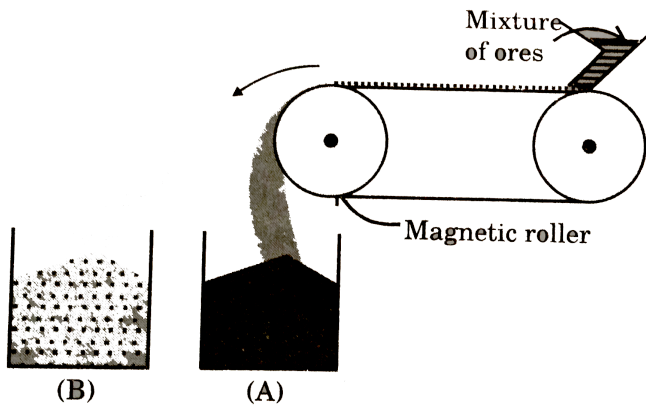
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502. The total number of ore of Cu from the following are ....

Atacamite, Sphalertie, Ruby copper, Chalcanthite, Fool's gold, Chalcopyrite, Angelsite, Baryte, Chalcocite, Zincite.

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Mixture of ores

Magnetic roller

(B)   (A)

503.

If mixture of ores contain Cassiterite, Zinc blende, Argentite, Haematite, $FeWO_4$ Chromite, Dolomite, Find the number of ores which is/are collected in container(B).

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504. The number of sulphide ores which are reduced by self redcution to produce their respective crude metals are:
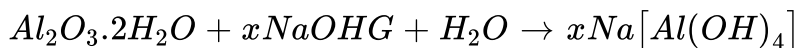
$ZnS, Cu_2S, PbS, FeS_2, HgS$

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505. Find the number of ores which can be concentrated by magnetic separation method.

$$Fe_2O_3, Fe_3O_4, FeCO_3, FeS_2, CuFeS_2, Cu_2O, ZnS, ZnCO_3, ZnO$$

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506. Balance the following reaction:

$$Al_2O_3.2H_2O + xNaOHG + H_2O \rightarrow xNa\big[Al(OH)_4\big]$$

What is the value of x?

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507. How many different compounds are present in carnallite?

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508. Among the following number of compound that would required electrolysis process for their extraction is/are :

$Al_2O_3.\ MgCL_2.\ Fe_2O_3.$

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509. Among the following total number of possible metals present in anode mud, which is obtained by electrolytic refining of copper.

Fe, Ag, Au, Pt, Pb, Zn

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510. Among the following total number of possible metals present in anode mud, which is obtained by electrolytic refining of copper.

Fe, Ag, Au, Pt, Pb, Zn

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511. Find th number of ores, which can be concentrated by magnetic separation method.

Galena, Copper pyrites,Haematite,Siderate

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512. Find the number of impurities which depostties as andode mud in the electrofining of copper.

Antimony, Selenium, Tellurium, Silver, Gold, Platinum

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513. How many of the following minerals containing Mg?

Magnesite, Carnallite, Epsom salt, Siderite

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514. The total number of carbonate ores among the following is .

(i)Argenitie   (ii)Calamine   (iii)Malachite   (iv)Siderite   (v)Galena

(vi)Magnetite (vii)Dolomite (viii)Cassiterite (ix)Bauxite

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515. Find the total number of ores in which roating process is used in metallurgy of corresponding metal: galena, haematite, calamine, zinc blende, cinnabar, horn silver, lime stone

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516. Find the total number of step in the following used during the extraction of spelter from zinc blende:

Poling, Electroefining, Roasting, Froth floatation method, Smelting, Magnetic separation.

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517. Find out the number of minerals given below which contain iron as Fe(II).

Haematite, Magnetite, Limonite, Siderite, Chromite, Wolframite

518. Amongst the following ores, the total number of oxide ores are:

Siderite, Magnetite, Haematite, Malachite, Zincite, Cuprite

519. How many of the following ores contain Silver?

Hornsilver, Cerrusite, Chalcopyrite, Galena, Anglesite, Argentite

520. How many of the ores from the following are the ore of Pb?

Cerussite, Malachite green, Galena, Epsom salt, Anglesite, Rutile, Siderite

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521. How many of the following metals is extracted by self reduction process?

Pb,Au,Mg,Sn,Fe,Al,Ag,Hg,Na,Zn,Cu,Ca

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522. How many of the given consequences are in general the result of roasting and/or calcination of concentrated ores?

(a) Removal of mositures

(b) Reduction of metal oxides into metal

(c) Removal of volatile impurities as elemental vapour or volatile oxides

(d) Conversion of concentrated ores into correspondin oxides

(e) Melting of concentrated ores

(f) Ores become porous

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