CHEMISTRY

AAKASH INSTITUTE ENGLISH

GENERAL PRINCIPLES AND PROCESSES OF ISOLATION OF ELEMENTS

Example

1. Name the compound that contains Mg and helps green plants during photosynthesis.

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2. Write the names and formulae of main ores of Fe, Cu, Al and Zn.

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3. Define 'Slagging operation'.

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4. Tin stone (cassiterite) is purified by magnetic separation method. Name and formulate the magnetic chemical present with it.

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5. Giving examples differentiate between calcination and roasting.

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6. Though tin stone is oxide of tin, yet roasting is carried out for this ore. Why ?

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7. What is the process of smelting ? Give one suitable example also.

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8. In Ellingham diagrams plots of $\Delta_f G$ (oxide formation) show positive slope except for the formation of $CO(g)$ from coke. Why ?

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9. Fe_2O_3 can be reduced by CO gas below $1123K$. How do you relate this statement with ellingham diagram?

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10. What is the percentage of carbon in pig iron and cast iron ?

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11. Name the zone of blast furnace and its importance that has temperature close to $1273K$ in the metallurgy of Fe.

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12. What is the main ore of copper from which it is extracted ?

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13. What is the material collected from reverberatory furnace in the metalurgy of copper ?

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14. In which form is ZnO subjected to smelting in retords made of clay ?

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15. Which elements are present with zinc when it is extracted from zinc oxide ?

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16. When is 'polling' used as the method of purification of metals ?

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17. Which chemical works as reducing agent in the process of poling ?

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18. What is the nature of elements which are purified by zone-refining method ?

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19. Write the equations for the Van Arkel method used for the refining of Zirconium, the two tempertures being $= 870K$ and $\cong 2070K$.

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20. Which metal is used for reducing Cr_2O_3 and Mo_2O_3 to metal ?

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21. Name some materials made from cast iron.

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22. Write some uses of aluminimum.

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Objective Type Questions One Option Is Correct

1. Haemoglobin is a complex of_____ .chlorophyll is a complex of_____ and vitamin B_{12} is a complex of_____ .

A. Fe, Co, Mg

B. Co, Mg, Fe

C. Mg, Fe, Co

D. Fe, Mg, Co

Answer:

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2. Which metal is used for extraction of Au and Ag and also for galvanisation of iron objects ?

A. Mg

B. Zn

C. Cr

D. Co

Answer: B

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3. Which of the following is the main ore of iron ?

A. $FeCO_3$

B. $FeO \cdot Cr_2O_3$

C. Fe_2O_3

D. FeS_2

Answer:

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4. Which of the following is not correctly matched ?

A. Chalcopyrites $\rightarrow CuFeS_2$

B. Smithsonite $\rightarrow ZnCO_3$

C. Magnetite $\rightarrow Fe_3O_4$

D. Argentite $\rightarrow Na_3AlF_6$

Answer:

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5. Which of the following is not a mineral of aluminium ?

A. Bauxite

B. Cryolite

C. China clay

D. Malachite

Answer:

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6. Which of the following metals is present in protein hormone insulin ?

A. Zn

B. Fe

C. Co

D. Mg

Answer:

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7. Which one of the following is used as an acidic flux in metallurgy ?

A. CaO

B. MgO

C. SiO_2

D. All of these

Answer:

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8. In the metallurgy of iron, the slag is

A. $FeSiO_3$

B. $CaCO_3$

C. $CaSiO_3$

D. CaO

Answer:

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9. What type of ores can be concentrated by magnetic separation method ?

A. Pyrolusite MnO_2

B. Chromite ore $FeO \cdot Cr_2O_3$

C. Magnetite Fe_3O_4

D. All of these

Answer:

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10. Which of the following is commonly used to produce foam in froth floatation process ?

A. Pine oil

B. Cresol

C. $NaCN$

D. Xanthate

Answer:

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11. Which of the following is used as collector in froth floatation process ?

A. Pine oil

B. Cresol

C. $NaCN$

D. Xanthate

Answer:

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12. Galena contains ZnS with PbS (Main ore). Which of the followin is used as depressant to stop ZnS to come with foam ?

A. $NaCN$

B. Aniline

C. Eucalyptus oil

D. H_2O

Answer:

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13. Serpeck's method involves the heating of bauxite with

A. $NaOH$

B. Na_2CO_3

C. $N_2 + C$

D. $CaCO_3$

Answer:

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14. Sulphide ore is converted to oxide form by using the process

A. Calcination

B. Roasting

C. Smelting

D. Kroll's method

Answer:

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15. Which of the following oxides cannot be reduced by auto or self reduction ?

A. HgO

B. Cu_2O

C. PbO

D. Al_2O_3

Answer:

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16. Which of the following is used as reducing agent in Gold schmidt method ?

A. Al

B. K

C. C

D. Mg

Answer:

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17. Which of the following is used to reduce $TiCl_4$ to Ti ?

A. C

B. Al

C. Mg

D. All of these

Answer:

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18. At $1250K$

$2FeO(s) \rightarrow 2Fe(s) + O_2(g), \Delta G = +320kJmol^{-1}$ of O_2

$2C(s) + O_2(g) \rightarrow 2CO(g), \Delta G = -430kJmol^{-1}$ of O_2

The following coupled reaction is spontaneous because

$2FeO(s) + 2C(s) \rightarrow 2Fe(s) + 2CO(g)$

A. (A) In $1st$ reaction entropy is increasing

B. (B) In $2nd$ reaction entropy is increasing

C. (C) ΔG of the net reaction is negative

D. (D) All of these

Answer:

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19. Ellingham diagrams are plots of ΔG_1° Vs T for the formation of

A. Oxides

B. Halides

C. Sulphides

D. All of these

Answer:

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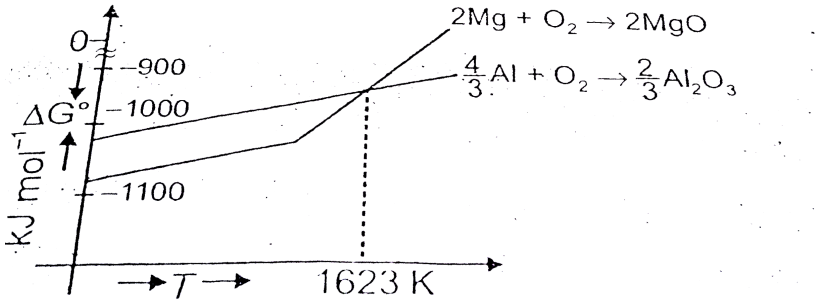
20. Which of the following statement is correct w.r.t. the following graph ?



A. Below $1623K$, Mg reduces Al_2O_3

B. Above $1623K$, Al reduces MgO

C. Both (1) & (2) are correct

D. Both (1) & (2) are wrong

Answer:

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21. In Ellingham diagrams of $\Delta_1 G$ oxide formation Vs T, which of the following graphs has negative slope ?

A. $C \rightarrow CO$

B. $Fe \rightarrow Fe_2O_3$

C. $Mg \rightarrow MgO$

D. All of these

Answer:

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22. On Ellingham diagrams if two graphs intersect each other, what does the point of intersection indicate ?

A. $\Delta G < 0$

B. $\Delta G = 0$

C. $\Delta G > 0$

D. Depends upon other conditions

Answer:

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23. Which of the following is incorrect w.r.t. metallurgy of iron in the blast furnace ?

A. Zone of combustion : $C + O_2 \rightarrow CO_2$

B. Zone of heat absorbtion : $CO_2 \rightarrow C + O_2$

C. Zone of slag formation : $CaO + SiO_2 \rightarrow CaSiO_3$

D. Zone of reduction : $Fe_2O_3 + 3C \rightarrow 3CO + 2Fe$

Answer:

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24. Which of the following has the lowest percentage of carbon in it?

A. Pig iron

B. Grey cast iron

C. Wrought iron

D. White cast iron

Answer:

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25. Which furnace is used for the extraction of iron from haematite ?

A. Reverberatory furnace

B. Blast furnace

C. Bessemer converter

D. Muffle furnace

Answer:

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26. Roasting of sulphide ore is generally performed in

A. Muffle furnace

B. Bessemer converter

C. Blast furnace

D. Reverberatory furnace

Answer:

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27. The final stage of self reduction for the extraction of Cu is carried out in

A. Reverberatory furnace

B. Blast furnace

C. Bessemer converter

D. Electric furnace

Answer:

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28. Zinc is extracted from zinc oxide by its reaction with coke in

A. Earthen clay retort

B. Blast furnace

C. Bessemer converter

D. Reverberatory furnace

Answer:

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29. Which of the following metal is leached by Cyanide process

A. Ore of Al

B. Ore of Cu

C. Ore of Ag

D. Ore of Zn

Answer:

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30. Hall Heroult method is used for the extraction of

A. Ti

B. Al

C. Au

D. Zn

Answer:

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31. During the collection of Al by Hall Heroult method, how much of graphite (carbon) is consumed per kg of aluminimum collected ?

A. $100g$

B. $200g$

C. $400g$

D. $500g$

Answer:

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32. boiling process is used for:

A. Metal sulphides

B. Metal carbonates

C. Metal bicarbonates

D. Metal oxides

Answer:

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33. Impure zince, as collected from earthen clay retort, is called

A. Blister zinc

B. Pig zinc

C. Zinc spelter

D. Cast zinc

Answer:

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34. What is the material collected from reverberatory furnace in the metalurgy of copper ?

A. CuO

B. Cu_2O

C. Cu_2S

D. Cu

Answer:

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

as :

A. Slag

B. Mud

C. Gangue

D. Flux

Answer:

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36. Sulphide ores of metals are usually concentrated by froth floatation process. Which one of the following sulphide ores offers an exception and is concentrated by chemical leaching?

A. Galena

B. Copper pyrites

C. Sphalerite

D. Argentite

Answer:

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37. Heating pyrites to remove sulphur is called

A. Smelting

B. Calcination

C. Roasting

D. Liquation

Answer:

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38. The process of converting hydrated alumina into anhydrous alumina is called

A. (a) Roasting

B. (b) Calcination

C. (c) Dressing

D. (d) Smelting

Answer:

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39. The electrolytic solution used for extraction of Al in Hall Heroult method is

A. $Al_2O_3 \cdot H_2O$

B. $Al_2O_3 + Na_3AlF_6$

C. Al_2O_3

D. $Al_2O_3 \cdot 2H_2O + C$

Answer:

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40. The extraction of zinc from zinc blende is achieved by :

A. Electrolytic reduction

B. Roasting followed by reduction with carbon

C. Roasting followed by reduction with another metal

D. Roasting followed by self reduction

Answer:

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41. Given below are the steps for extraction of copper from its ore. Write the reaction involved.

(i) Roasting of copper (I) sulphide.

(ii) Reduction of copper (I) oxide with copper (I) sulphide.

(iii) Electrolytic refining

(b) Draw a neat and well labelled diagram for electrolytic refining of copper.

A. Electrolytic reduction

B. Roasting followed by reduction with coke

C. Roasting , smelting followed by self reduction

D. Roasting , smelting followed by reduction by another metal

Answer:

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42. Which of the following metals is purified by distillation process ?

A. Zn

B. Fe

C. Al

D. Cu

Answer:

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43. Vapour phase refining can be carried out in case of

A. Ni

B. Zr

C. Ti

D. All of these

Answer:

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44. Zone refining is based on the principle that _____ .

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

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

C. Greater noble character of solid metal than that of impurity

D. Greater solubility of the impurity in the molten state of metal than the solid

Answer:

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45. Which of the following is not a method of purification of metals ?

A. Liquation

B. Distillation

C. Zone refining

D. Galvanisation

Answer:

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46. Assertion: Zone refining method is used to produce pure metals which are used as semiconductors.

Reason: Semiconductors are used in highly pure form.

A. Very reactive

B. Very less reactive

C. Moderately reactive

D. Semiconductors

Answer:

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47. Which of the following is not a use of aluminimum ?

A. Making electric wires

B. Making silver paint

C. Reducing agent for Cr_2O_3

D. Galvanisation of iron

Answer:

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48. Which of the following is not a use of zinc ?

A. Making german silver

B. Making brass

C. Making steam pipes

D. Galvanising iron

Answer:

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49. Wrought iron is used for making

A. Anchors

B. Agricultural implements

C. Bolts

D. All of these

Answer:

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50. Which of the followed metals can be extracted by using carbon reduction method, roasting followed by electrolysis and pyrometallurgy (self reduction) ?

A. Al

B. Zn

C. Cu

D. Fe

Answer:

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51. Purest form of iron is

A. Cast iron

B. Hard iron

C. Stainless steel

D. Wrought iron

Answer:

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52. The metal oxide which cannot be reduced to metal by carbon is

A. ZnO

B. Fe_2O_3

C. PbO

D. Al_2O_3

Answer:

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53. 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:

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54. Which of the following pairs of metals is purified by van-Arkel method?

A. Ti

B. Zr

C. Hf

D. All of these

Answer:

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55. State briefly the principles which serve as basis for the following operations in metallurgy :

(i) Froth floatation process

(ii) Zone refining

(iii) Refining by liquation

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 particles

Answer:

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56. In zone refining methods, the molten zone

A. Consists of impurities

B. Contains less impurities than the original impurities

C. Contains the purified metal only

D. May be impurities or pure metal since it moves to either side

Answer:

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57. $Ag_2S + NaCN \rightarrow (A), (A) + Zn \rightarrow (B) + Ag$

(A) and (B) are respectively

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

B. $Na\left[Ag(CN)_2\right], Na_2\left[Zn(CN)_4\right]$

C. $Na\left[Ag(CN)_2\right], Na\left[Zn(CN)_3\right]$

D. $Na_3\left[Ag(CN)_3\right], Na_2\left[Zn(CN)_4\right]$

Answer:

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58. Poling process is used

A. For the removal of Cu from Cu_2O

B. For the removal of Al from Al_2O_3

C. For the removal Fe from Fe_2O_3

D. All of these

Answer:

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59. Which one of the following contains both iron and copper ?

A. Cuprite

B. Chalcocite

C. Chalcopyrite

D. Malachite

Answer:

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60. Choose the false statement

A. Easily fusible metals like Pb and Bi are purified by liquation

B. Low boiling point metals like Zn and Hg are purified by boiling distillation

C. Si, Ge, Ga are purified by poling

D. Ti, Zr, V are purified by van Arkel method

Answer:

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61. In zone refining methods, the molten zone

A. Consists of more impurities than solid

B. Moves to either side

C. Consists of less impurities than solid

D. Both (1) & (2)

Answer:

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62. The refractory material used in the lining of blast furnace is

A. BaO

B. MgO

C. SiO_2

D. Na_2O

Answer:

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Objective Type Questions More Than One Option Are Correct

1. Which of the following statement is/are true ?

A. (a) Calamine and siderite are carbonates

B. (b) Argentite and cuprite are oxides

C. (c) Zinc blende and iron pyrites are sulphides

D. (d) Malachite and azurite are ores of copper

Answer:

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2. Bessemerisation is carried out for

A. Fe

B. Al

C. Cu

D. Ag

Answer:

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3. Leaching is used for which metal/s ?

A. (a) Ag

B. (b) Al

C. (c) Au

D. (d) Pb

Answer:

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4. Which of the following gives nitrogen dioxide gas on heating ?

A. KNO_3

B. $AgNO_3$

C. $LiNO_3$

D. $Pb(NO_3)_2$

Answer:

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5. Which of the following statements is/are correct for electrolytic refining ?

A. The impure metal is made the anode while a thin sheet of pure metal is used as the cathode

B. The electroyte used is a covalent compound of the metal

C. During electrolysis insoluble impurities which settle down below anode are known as anode mud

D. On account of electrolysis, the metal is indirectly transferred from anode to cathode

Answer:

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6. Which of the following ores contain oxygen ?

A. Bauxite

B. Chalcopyrite

C. Haematite

D. Calamine

Answer:

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7. Hydrometallurgy is useful in the extraction of

A. Au

B. Ag

C. Sn

D. Hg

Answer:

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8. Which of the following are correctly mathced ?

Column I	Column II
(1) Cyanide process	Extraction of Au
(2) Electrolytic reduction	Extraction of Al
(3) Zone refining	Ultrapure Ge
(4) Leaching	Extraction of Au, Ag

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9. For which of the following metals can be extracted by aluminothermic process ?

A. Mn

B. Fe

C. Cr

D. Mg

Answer:

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10. Which of the following is true for calcination of metal ore ?

A. It makes the ore more pourous

B. It heated to temperature when just fusion begins

C. Hydrated salts lose their water of crystallisation

D. Impurities of S and Sb are removed in the form of volatile oxides

Answer:

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11. Which of the following are true for electrolytic extraction of aluminimum ?

A. Cathode material contains graphite

B. Anode material contains graphite

C. Cathode reacts away forming CO_2

D. Anode reacts away forming CO_2

Answer:

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Linked Comprehension Type Questions

1. In Castner's process some sodium metal is lost due to

A. Reaction with dissolved O_2 in molten $NaOH$

B. It's high reactivity, it attacks other substances present in the system

C. High temperature at which some of it vapourizes

D. All of these

Answer:

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2. Sodium metal can be extracted by either Castner's Process or Down's process

Castner's process.

Electrolyte $\rightarrow$ fused $NaOH$

Cathode and anode are made up of a steel rod and Ni cylinder

respectively the reaction takes place as follows :

At cathode $Na^+ + e^- \rightarrow Na$

At anode $OH^- \rightarrow \frac{1}{2}H_2O + \frac{1}{4}O_2 \uparrow + e^-$

Down's process :

Electrolyte $\rightarrow$ fused $NaCl$ and $CaCl_2$

Cathode and anode are ring shaped iron metal and graphite respectively.

The reaction takes place as follows :

$Na^+ + e^- \rightarrow Na$

$Cl^- \rightarrow \frac{1}{2}Cl_2 \uparrow + e^-$

$CaCl_2$ is used along with $NaCl$ due to

A. Increase in electrical conductivity of $NaCl$

B. Lowering in melting point of the mixture compared to pure $NaCl$

C. $CaCl_2$ protects Na from getting vapourized

D. Visocosity of the mixture of $NaCl$ or $CaCl_2$ is lower than pure $NaCl$.

Answer:

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3. Instead of graphite, nickel anode can't be used in Dow's process because

A. Graphite is inert to Cl_2

B. At high temperature Ni gets vapourized

C. Ni is a corrosive metal

D. Ni attacks Cl_2 to produce $NiCl_2$

Answer:

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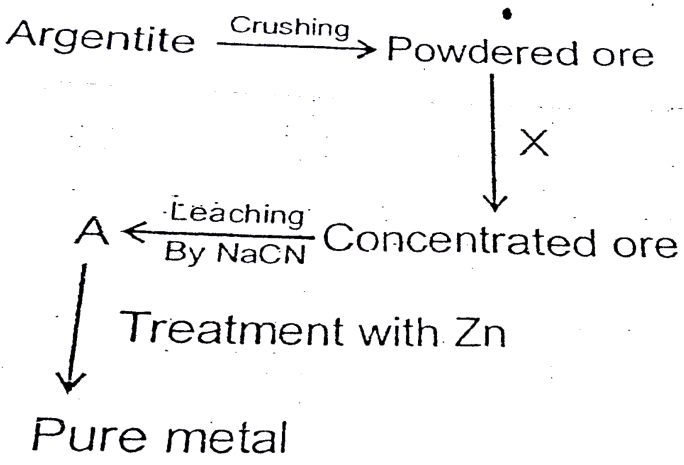

4.

This ore is concentrated by

A. Gravity separation

B. Leaching

C. Froth floatation

D. All of these

Answer:

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5.

Zn is used in final step because

A. It is less costly

B. It have negative reduction potential

C. It have positive reduction potential

D. It does not form amalgam

Answer:

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6.

Metal is further purified by

A. Distillation

B. Cupellation

C. Electrolysis

D. Both (2) & (3)

Answer:

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7. Metallurgy of Fe is carried in Blast furnace. Blast furnace is divided in following zones.

a. Combustion zone b. Fusion zone

c. Reduction zone d. Preheating zone

Slag formed in Blast furnace is

A. $FeSiO_3$

B. $CaSiO_3$

C. $CaCO_3$

D. Both (1) & (2)

Answer:

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8. Metallurgy of Fe is carried in Blast furnace. Blast furnace is divided in following zones.

a. Combustion zone b. Fusion zone

c. Reduction zone d. Preheating zone

At $350^{\circ} C$ which of the reaction is better reducing agent ?

A. $C + O_2 \rightarrow CO_2$

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

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

D. $CO_2 + C \rightarrow 2CO$

Answer:

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9. Metallurgy of Fe is carried in Blast furnace. Blast furnace is divided in following zones.

a. Combustion zone b. Fusion zone

c. Reduction zone d. Preheating zone

Slag formation is important because

A. It helps to remove impurities from molten metal

B. It prevents contact of molten metal and air

C. It helps to remove volatile impurities

D. Both (1) & (2)

Answer:

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Assertion Reason Type Question

1. STATEMENT-1 : Zinc and not copper is used in the recovery of silver from the complex $\left[Ag(CN)_2\right]^-$

and

STATEMENT-2 : Zinc is more powerful oxidising agent than copper.

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

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

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

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

Answer:

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2. STATEMENT-1 : Pine oil act as frothing agent in froth floatation.

and

STATEMENT-2 : Sulphide ores are concentrated by froth floatation method.

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

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

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

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

Answer:

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3. STATEMENT-1 : Leaching is a proess of concentration

and

STATEMENT-2 : Leaching involves treatment of the ore with a suitable reagent so as to make it soluble while impurities remains insoluble

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

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

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

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

Answer:

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4. STATEMENT-1 : Hydrometallurgy is used for extraction of Ag and Au.

and

STATEMENT-2 : Pyrometallurgy is another name of hydrometallurgy.

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

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

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

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

Answer:

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5. STATEMENT-1 : $NaCN$ acts as a depresent for ZnS but does not prevent PbS from the formation of froth.

and

STATEMENT-2 : $NaCN$ combines with ZnS to form a complex $Na_2\left[Zn(CN)_4\right]$ on the surface of ZnS and thus prevents it from formation of froth.

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

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

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

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

Answer:

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6. STATEMENT-1 : Metal is not extracted from metal nitrate.

and

STATEMENT-2 : Nitrates of metals are water soluble in nature.

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

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

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

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

Answer:

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7. STATEMENT-1 : In moist air, copper corrodes to produce a green layer on the surface.

and

STATEMENT-2 : Oxide layer is formed in presence of moist air.

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

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

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

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

Answer:

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8. STATEMENT-1 : Generally, ores do not exist in nitrite compound.

and

STATEMENT-2 : Nitrates are not thermally stable.

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

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

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

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

Answer:

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9. STATEMENT-1 : Na can be obtained by electrolysis of molten $NaCl$.

and

STATEMENT-2 : Na^+ cannot be reduced economically by carbon.

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

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

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

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

Answer:

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10. STATEMENT-1 : Gold gernally exists in native form.

and

STATEMENT-2 : Gold is less reactive.

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

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

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

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

Answer:

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11. STATEMENT-1 : Zr is purified by zone refining

and

STATEMENT-2 : Zone refining is based on fractional crystallisation.

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

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

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

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

Answer:

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12. STATEMENT-1 : SiO_2 is the main impurity in white alumina.

and

STATEMENT-2 : White alumina is concentrated by Baeyer's process in Leaching.

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

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

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

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

Answer:

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Matrix Match Type Questions

1. O.N of Fe in $K_4\left[Fe(CN)_6\right]$ is

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2. Complete and balanced the equations:

$Al + HCl \rightarrow$ _ _ _ + _ _ _

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3. The following compounds have been arranged in order of their increasing thermal stabilities. Identify the correct order:

K_2CO_3(I)$MgCO_3$(II)$CaCO_3$ (III)$BeCO_3$ (IV):

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Integar Answer Type Questions

1. What is the co-ordination number of Ag in the product obtained after Leaching process ?

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2. What is the oxidation state of Ni in its purification by Mond process ?

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3. What is the number of metal atoms in one molecule of chalcopyrite ?

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4. Out of following how many ores are concentrated by froth flotation ?

(i) Chalcopyrite (ii) Silver glance

(iii) Siderite (iv) Malachite

(v) Horn silver (vi) Fools' gold

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5. Main ore of Zn is zinc spinel. The co-ordination number of Zn will be.

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Multiple True False Tyep Questions

1. STATEMENT-1 : $CuSO_4$ acts as froth activator in froth floatation process.

STATEMENT-2 : Froth floatation method belong with benefecation of metallurgy.

STATEMENT-3 : $NaCN$ as depresent to form complex with ZnS out of PbS and ZnS.

A. $\top T$

B. FFF

C. TFT

D. $F \top$

Answer:

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2. STATEMENT-1 : van Arkel method is used for purification.

STATEMENT-2 : van Arkel method is based on the fractional crystallisation.

STATEMENT-3 : van Arkel method is used for the purification of Ni.

A. TTF

B. FTF

C. TFT

D. TFF

Answer:

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3. STATEMENT-1 : van Arkel de-Boer method is used for the purification of Ti.

STATEMENT-2 : In van Arkel method, Iodine is used.

STATEMENT-3 : Zone refining is based on chromatography

A. TTF

B. TTT

C. FTT

D. FTF

Answer:

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4. STATEMENT-1 : Refining of gold contaiminated with silver is termed as parting of Gold.

STATEMENT-2 : In chlorine parting, dry chlorine is bubbled through the molten mass of gold.

STATEMENT-3 : Gold can be purified by poling.

A. TTT

B. FTT

C. TFF

D. TTF

Answer:

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5. STATEMENT-1 : Poling is used in purification of Cu from its oxide.

STATEMENT-2 : Coke cannot reduce CuO to Cu but gree wood can reduce.

STATEMENT-3 : Sn is also purified by poiling process.

A. TFT

B. FFT

C. TTT

D. TFF

Answer:

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Subjective Type Questions

1. Ksp of $Mg(OH)_2$ is 4.0×10^{-12} . The number of moles of Mg^{2+} ions in one litre of its saturated solution in 0.1 M NaOH is

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2. Magnesium oxide is used for the lining in steel making furnace because

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3. Dolomite can also be treated to get $MgCl_2$ which in turn is electrolysed to get Mg (Dow natural brine process) . Give reactions for this process.

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4. A sulphide ore (A) on roasting leaves a residue (B). (B) on heating with chlorine gives (C), sulphide in water, addition of excess potassium

iodide to a solution of (C) gives a solution (D) A brown precipitate (E) is formed when a solution of ammonium sulphate is added to an alkaline a solution of (D). Identify (A) to (E).

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5. Write the chemical reactions involved in the extraction of metallic silver from argentite.

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6. Galena is reported to have $23.8\ \%\ PbS$. Calculate the volume of oxygen required at STP to roast $10kg$ galena to PbO and SO_2.

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7. Explain the following

(i) Excess of carbon is added to zinc metallurgy.

(ii) In the elctrolysis of alumina, cryolite is added to alumina.

(iii) Coke does not cause reduction of Al_2O_3.

(iv) Gold is soluble in aquaregia, silver is not.

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8. From the following reactions. Identify A to F

$Mg \xrightarrow[\Delta]{\text{air}}$ Colourless solid$(A) \xrightarrow{HCl}$ colourless solution$(B) \xrightarrow{Na_2CO_3}$ White pp

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Aakash Challengers Questions

1. Parting process associate with metallurgy of

A. Fe

B. Cu

C. Ag

D. Zn

Answer:

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2. Parke's process, used in desilverisation of lead, based on the :

(a)Different melting point

(b)Different adsorption power

(c)Different wetting properties

(d)Distribution Law

A. Different melting point

B. Different adsorption power

C. Different welting properties

D. Distribution Law

Answer:

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3. Magnetic separation can be used to concentrate

(a)(Ore+Impurity S n O 2 + F e W O 4

(a)Ore+Impurity S n O 2 + M n W O 4

(c)Ore+Impurity F e C r 2 O 4 + S i O 2

All of these

A. $\begin{matrix}\text{Ore+Impurity}\\ SnO_2 + FeWO_4\end{matrix}$

B. $\begin{matrix}\text{Ore+Impurity}\\ SnO_2 + MnWO_4\end{matrix}$

C. $\begin{matrix}\text{Ore+Impurity}\\ FeCr_2O_4 + SiO_2\end{matrix}$

D. All of these

Answer:

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4. Choose the inocrrect pair

A. Froth activator-$NaCN$

B. Froth collector-Potassium amyl xanthate

C. Foaming agent-Pine oil

D. All of these

Answer:

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5. For red alumina, process involved in Leaching process is

A. Hall's process

B. Serpeck's process

C. Baeyer's process

D. Both (1) &(3)

Answer:

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6. The composition of purple of Cassius is

A. $Sn(OH)_4$

B. $Sn(OH)_2$

C. $Sn(OH)_2 \cdot SnCl_2$

D. SnO_2

Answer:

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7. Which one of the statement on Bessemerisation is false ?

A. Pig iron is converted to stainless stell

B. The process involves chemical oxidation of impurities in Pig iron

C. It is adopted if large amount of phosphorous is present as impurity in Fe

D. Loss of iron is the order of $15\ \%$

Answer:

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8. Slag formed during extraction of Cu from $CuFeS_2$ is

A. $FeCO_3$

B. $FeSiO_3$

C. $CaSiO_3$

D. $CuSiO_3$

Answer:

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Try Yourself

1. Match the following from column I to column II

Column I	Column II
Malachite	Fe
Sphalerite	Ag
Horn silver	Zn
Chromite	Cu

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2. Name the vitamin that contains metal in it. Name the metal also

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3. Name some elements that can occur free in nature

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4. Define the term flux.

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5. Discuss the use of an acidic flux in metallurgy.

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6. Name and formula of two magnetic ores.

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7. Which types of ores are purified by hydraulic washing ? Give two examples also.

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8. Which of the following is used as collector in froth floatation process ?

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9. Sulphdies ores are converted to oxides before reduction . This is explained on the basic of which of the following ?

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10. Discuss the process of roasting with suitable example.

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11. During roasting the temperature should be kept below its m.p. Why ?

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12. What type of the reduction method does the following reaction show (Bessemer converter reaction of metallurgy of copper) ?

$2Cu_2O + Cu_2S \xrightarrow{\Delta} 6Cu + SO_2$

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13. Which reducing agent is commonly employed for reduction of

$(a) ZnO \text{ to } Zn$

$(b) Cr_2O_3 \text{ to } Cr$

$(c) TiCl_4 \text{ to } Ti$

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14. In some cases, Ellingham diagrams (graphs) show a bend. What do you refer from it ?

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15. On Ellingham diagrams if two graphs intersect each other, what does the point of intersection indicate ?

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16. Name the four main zones of blast furnace in the extraction of Fe from Fe_2O_3.

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17. Write the complete set of reactions occuring in the zone of reduction in the blast furnace, in the metallurgy of iron.

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18. Coke can be used to reduce Cu_2O. Explain it based on thermodynamic view.

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19. What the impure copper collected from Bessemer converter commonly called as ?

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20. Name and formulate themain ore from which zinc is extracted.

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21. What is the impure form of zinc commonly known as ?

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22. Name and formulate the reagent used for the leaching of argentite.

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23. What is the hydrometallurgy of silver or gold commonly known as ?

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24. Write the equation of the net reaction taking place in Hall Heroult electrolytic method for the collection of aluminium ?

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25. Metals purified by liquation method. ..... , ...

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26. Name two metals which are purified by distillation method.

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27. Impure tin contains SnO_2 as one of the impurities. Name the specific method employed for converting SnO_2 present in impure metal to tin.

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28. In electrorefining the impure metal is made

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29. Name the main method of purification employed for the purification of Cu, Zn and Al.

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30. Write two uses of zinc.

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31. What are silver paint and german silver made of ?

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32. Write some uses of wrought iron.

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

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