CHEMISTRY

BOOKS - KUMAR PRAKASHAN KENDRA CHEMISTRY (GUJRATI ENGLISH)

GENERAL PRINCIPLES AND PROCESSES OF ISOLATION OF ELEMENTS

Examples

1. Suggest a condition under which magnesium could reduce alumina. The two equations are :

(a) $\frac{4}{3}Al + O_2 \rightarrow \frac{2}{3}Al_2O_3$

(b) $2Mg + O_2 \rightarrow 2MgO$

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2. Although thermodynamically feasible, in practice, magnesium metal is not used for the reduction of alumina in the metallurgy of aluminium. Why?

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3. Why is the reduction of a metal oxide easier if the metal formed is in liquid state at the temperature of reduction ?

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4. At a site, low grade copper ores are available and zinc and iron scraps are also available. Which of the two scraps would be more suitable for reducing the leached copper ore and why?

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Section A Questions

1. Define the following terms.

(i) Minerals

(ii) Ores

(ii) Metallurgy

(iv) Gangue

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2. Explain occurence of elements in nature.

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3. Enlist the various steps involved in extraction of metals.

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4. What is concentration of ore?

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5. What is ore benefaction ?

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6. Explain concentration of ore by :

(i) Hydraulic Washing

(ii) Magnetic Separation

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7. Explain concentration of sulphide ores.

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8. Explain froth floatation process.

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9. Explain Leaching of:

(i) Alumina from Bauxite (Bayer's Process)

(ii) Gold and Silver (Cyanide Process)

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10. Explain isolation of metals from concentrated ore.

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11. Explain the role of thermodynamics in extraction of elements.

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12. Explain how thermodynamics is helfpul in selection of reducing agent for metallurgical operations.

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13. Explain theory of reduction of oxide of metal with carbon as a reducing agent.

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14. Explain the role of reducing agent in a reduction of metal oxides.

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15. State the important features of Ellingham diagram. Also state its limitation.

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16. Explain extraction of iron from its oxides.

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17. Explain thermodynamics of extraction of iron from its oxide.

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18. Explain extraction of : (i) Copper from Copper(I) Oxide (ii) Zinc from zinc oxide.

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19. Explain electrometallurgy in detail.

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20. Explain hydrometallurgical process with suitable example.

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21. Explain Hall-Heroult process.

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22. Explain electrolytic reduction of alumina.

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23. Explain extraction of elements by oxidation.

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24. Explain zone refining process.

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25. Explain refining by fractional crystallization.

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26. Explain vapour phase refining.

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27. Explain electrolytic refining.

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28. Explain refining by Distillation and Liquation.

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29. Explain chromatographic methods to refine the elements.

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30. States uses of aluminium, copper, zinc and iron.

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Section B Intext Questions And Answers

1. Which of the ores mentioned in a table can be concentrated by magnetic separation method ?

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2. What is the significance of leaching in the extraction of aluminium ?

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3. The reaction, $Cr_2O_3 + 2Al \rightarrow Al_2O_3 + 2Cr, \left(\Delta_r G^0 = -421kJ\right)$ is thermodynamically feasible as is apparent from the Gibb's energy value. Why does it not take place at room temperature ?

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4. Is it true that under certain conditions, Mg can reduce Al_2O_3 and Al can reduce MgO ? What are those conditions ?

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Section C Textual Exercise

1. Copper can be extracted by hydrometallurgy but not zinc. Explain.

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2. What is the role of depressant in froth floatation process ?

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

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4. Explain : (i) Zone refining

(ii) Column chromatography.

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5. Out of C and CO, which is a better reducing agent at 673 K?

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6. Name the common elements present in the anode mud in electrolytic refining of copper. Why are they so present ?

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7. Write chemical reactions taking place in the extraction of zinc from zinc blende.

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8. State the role of silica in the metallurgy of copper.

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9. What is meant by the term "Chromatography" ?

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10. What criterion is followed for the selection of the stationary phase in chromatography ?

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11. Describe a method for refining nickel.

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12. How can you separate alumina from silica in a bauxite ore associated with silica ? Give equations, if any.

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13. Giving examples, differentiate between ‘roasting' and 'calcination'.

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14. How is 'cast iron' different from 'pig iron' ?

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15. Differentiate between "minerals" and "ores".

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16. Why copper matte is put in silica lined converter ?

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17. What is the role of cryolite in the metallurgy of aluminium ?

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18. How is leaching carried out in case of low grade copper ores ?

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19. Why is zinc not extracted from zinc oxide through reduction using CO ?

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20. The value of ΔG° for formation of Cr_2O_3 is $-540kJmol^{-1}$ and that of Al_2O_3 is $-827kJmol^{-1}$. Is the reduction of Cr_2O_3 possible with Al ?

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21. Out of C and CO which is a better reducing agent for ZnO ?

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22. The choice of a reducing agent in a particular case depends on thermodynamic factor. How far do you agree with this statement ? Support your opinion with two examples.

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23. Name the processes from which chlorine is obtained as a by-product. What will happen if an aqueous solution of NaCl is subjected to electrolysis ?

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24. What is the role of graphite rod in the electro metallurgy of aluminium ?

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25. Predict conditions under which Al might be expected to reduce MgO.

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Section D Ncert Exemplar Solutions Multiple Choice Questions

1. In the extraction of chlorine by electrolysis of brine.....

A. oxidation of CI^- ion to chlorine gas occurs.

B. reduction of Cl^- ion to chlorine gas occurs.

C. for overall reaction ΔG° has negative value.

D. a displacement reaction takes place.

Answer: A

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2. When copper ore is mixed with silica, in a reverberatory furnace copper matte is produced. The copper matte contains

A. Sulphides of copper (II) and iron (II)

B. Sulphides of copper (II) and iron (III)

C. Sulphides of copper (I) and iron (II)

D. Sulphides of copper (I) and iron (III)

Answer: C

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3. Which of the following reactions is an example of autoreduction ?

A. $Fe_3O_4 + 4CO \rightarrow 3Fe + 4CO_2$

B. $Cu_2O + C \rightarrow 2Cu + CO$

C. $Cu^{2+}_{(aq)} + Fe_{(s)} \rightarrow Cu_{(s)} + Fe^{2+}_{(aq)}$

D. $Cu_2O + \frac{1}{2}Cu_2S \rightarrow 3Cu + \frac{1}{2}SO_2.$

Answer: D

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4. A number of elements are available in earth's crust but most abundant elements are

A. Al and Fe

B. Al and Cu

C. Fe and Cu

D. Cu and Ag

Answer: A

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5. Zone refining is based on the principle that....

A. Impurities of low boiling metals can be separated by distillation.

B. Impurities are more soluble in molten metal than in solid metal.

C. Different components of a mixture are differently adsorbed on an adsorbent.

D. Vapours of volatile compound can be decomposed in pure metal.

Answer: B

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6. In the extraction of copper from its sulphide ore, the metal is formed by the reduction of CuO with....

A. FeS

B. CO

C. Cu_2S

D. SO_2

Answer: C

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7. Brine is electrolysed by using inert electrodes. The reaction at anode is .....

A. $Cl^-_{(aq)} \rightarrow \frac{1}{2}Cl_{2(g)} - e^-, E^{\Theta}_{(\text{cell})} = 1.36V$

B. $2H_2O_{(l)} \rightarrow O_{2(g)} + 4H^+_{(aq)} + 4e^-, E_{(\text{cell})^{\Theta}} = 1.23V$

C. $Na^+_{(aq)} + e^- \rightarrow Na_{(s)}, E_{(\text{cell})^{\Theta}} = 2.71V$

D. $H^+_{(aq)} + e^- \rightarrow \frac{1}{2}H_{2(g)}, E^{\Theta}_{(\text{cell})} = 0.00V$

Answer: A

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8. In the metallurgy of aluminium

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

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

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

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

Answer: B

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9. Electrolytic refining is used to purify which of the following metals ?

A. Cu and Zn

B. Ge and Si

C. Zr and Ti

D. Zn and Hg

Answer: A

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10. Extraction of gold and silver involves leaching the metal with CN-ion. The metal is recovered by .....

A. Displacement of metal by some other metal from the complex ion.

B. Roasting of metal complex.

C. Calcination followed by roasting.

D. Thermal decomposition of metal complex.

Answer: A

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11. Choose the correct option of temperature at which carbon reduces FeO to iron and produces CO.

A. Below temperature at point A.

B. Approximately at the temperature corresponding to point A.

C. Above temperature at point A but below temperature at point D.

D. Above temperature at point A.

Answer: D

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12. Below point 'A' FeO can

A. be reduced by carbon monoxide only.

B. be reduced by both carbon monoxide and carbon.

C. be reduced by carbon only.

D. not be reduced by both carbon and carbonmonoxide.

Answer: A

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13. For the reduction of Feo at the temperature corresponding to point D, which of the following statements is correct?

A. ΔG° value for the overall reduction reaction with carbon monoxide is zero.

B. ΔG° value for the overall reduction reaction with a mixture of 1 mol carbon and 1 mol oxygen is positive.

C. ΔG° value for the overall reduction reaction with a mixture of 2 mol carbon and 1 mol oxygen will be positive.

D. ΔG° value for the overall reduction reaction with carbon monoxide is negative.

Answer: A

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Section D Ncert Exemplar Solutions Multiple Choice Questions More Than One Options

1. At the temperature corresponding to which of the points in Figure, FeO will be reduced to Fe by coupling the reaction

$2FeO \rightarrow 2Fe + O_2$ with all of the following reactions ?

(1) $C + O \rightarrow CO_2$ (2) $2C + O_2 + 2CO$ and (3) $2CO + O_2 \rightarrow 2CO_2$

A. Point A

B. Point B

C. Point D

D. Point E

Answer: B::D

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2. Which of the following options are correct?

A. Cast iron is obtained by remelting pig iron with scrap iron and coke using hot air blast.

B. In extraction of silver, silver is extracted as cationic complex.

C. Nickel is purified by zone refining.

D. Zr and Ti are purified by Van Arkel method.

Answer: A::D

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3. In the extraction of aluminium by Hall-Heroult process, purified Al_2O_3 is mixed with CaF_2 to...

A. Lower the melting point of Al_2O_3.

B. Increase the conductivity of molten mixture.

C. Reduce Al^{3+} into $Al_{(s)}$

D. Acts as catalyst.

Answer: A::B

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4. Which of the following statements is correct about the role of substances added in the froth floatation process ?

A. Collectors enhance the non-wettability of the mineral particles.

B. Collectors enhance the wettability of gangue particles.

C. By using depressants in the process two sulphide ores can be separated.

D. Froth stabilisers decrease wettability of gangue.

Answer: A::C

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5. In the Froth Floatation process, zinc sulphide and lead sulphide can be separated by .....

A. Using collectors.

B. Adjusting the proportion of oil to water.

C. Using depressant.

D. Using froth stabilisers.

Answer: B::C

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6. Common impurities present in bauxite are.....

A. CuO

B. ZnO

C. Fe_2O_3

D. SiO_2

Answer: C::D

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7. Which of the following ores are concentrated by froth floation ?

A. Haematite

B. Galena

C. Copper pyrites

D. Magnetite

Answer: B::C

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8. Which of the following reactions occur during calcination ?

A. $CaCO_3 \rightarrow CaO + CO_2$

B. $2FeS_2 + \frac{11}{2}O_2 \rightarrow Fe_2O_3 + 4SO_2$

C. $Al_2O_3.xH_2O \rightarrow Al_2O_3 + xH_2O$

D. $ZnS + \frac{3}{2}O_2 \rightarrow ZnO + SO_2$

Answer: A::C

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9. For the metallurgical process of which of the ores calcined ore can be reduced by carbon ?

A. Haematite

B. Calamine

C. Iron pyrites

D. Sphalerite

Answer: A::B

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10. The main reactions occurring in blast furnace during extraction of iron from haematite are....

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

B. $FeO + SiO_2 \rightarrow FeSiO_3$

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

D. $CaO + SiO_2 \rightarrow CaSiO_3$

Answer: A::D

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11. In which of the following method of purification, metal is converted to its volatile compound which is decomposed to give pure metal ?

A. Heating with stream of carbon monoxide.

B. Heating with iodine.

C. Liquation.

D. Distillation.

Answer: A::B

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12. Which of the following statements are correct?

A. A depressant prevents certain type of particle to come to the froth.

B. Copper matte contains Cu_2S and ZnS.

C. The solidified copper obtained from reverberatory furnace has blistered appearance due to evolution of SO_2 during the extraction.

D. Zinc can be extracted by self-reduction.

Answer: A::C

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13. In the extraction of chlorine from brine .....

A. ΔG° for the overall reaction is negative.

B. ΔG° for the overall reaction is positive.

C. E° for overall reaction has negative value.

D. E° for overall reaction has positive value.

Answer: B::C

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Section D Ncert Exemplar Solutions Short Answer Type Questions

1. Why is an external emf of more than 2.2 V required for the extraction of Cl_2 from brine ?

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2. At temperatures above 1073 K coke can be used to reduce FeO to Fe. How can you justify this reduction with Ellingham diagram?

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3. Wrought iron is the purest form of iron. Write a reaction used for the preparation of wrought iron from cast iron. How can the impurities of sulphur, silicon and phosphorus be removed from cast iron ?

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4. How is copper extracted from low grade copper ores ?

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5. Write two basic requirements for refining of a metal by Mond's process and by Van-Arkel Method.

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6. Although carbon and hydrogen are better reducing agents but they are not used to reduce metallic oxides at high temperatures. Why?

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7. The purest form of iron is prepared by oxidising impurities from cast iron in a reverberatory furnace. Which iron ore is used to line the furnace ? Explain by giving reaction.

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8. The mixture of compounds A and B is passed through a column of Al_2O_3 by using alcohol as eluant. Compound A is eluted in preference to compound B. Which of the compounds A or B. is more readily adsorbed on the column ?

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9. Why is sulphide ore of copper heated in a furnace after mixing with silica ?

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10. Why are sulphide ores converted to oxide before reduction ?

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11. Which method is used for refining Zr and Ti ? Explain with equation.

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12. What should be the considerations during the extraction of metals by electrochemical method ?

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13. What is the role of flux in metallurgical processes?

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14. How are metals used as semiconductors refined ? What is the principle of the method used like germinum, silicon etc.?

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15. Write down the reactions taking place in Blast furnace related to the metallurgy of iron in the temperature range 500-800 K.

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16. Give two requirements for vapour phase refining.

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17. Write the chemical reactions involved in the extraction of gold by cyanide process. Also give the role of zinc in the extraction.

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Section D Ncert Exemplar Solutions Assertion And Reason Type

1. Assertion : Nickel can be purified by Mond's process.

Reason: $Ni(CO)_4$ is a volatile compound which decomposes at 460 K to give pure Ni.

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

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

C. Assertion is true but reason is false.

D. Assertion is false but reason is true.

Answer: A

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2. Assertion : Zirconium can be purified by Van Arkel method.

Reason : Zrl_4 is volatile and decomposes at 1800 K

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

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

C. Assertion is true but reason is false.

D. Assertion is false but reason is true.

Answer: A

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3. Assertion : Sulphide ores are concentrated by Froth Flotation method.

Reason : Cresols stabiles the froth in Froth Flotation method,

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

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

C. Assertion is true but reason is false.

D. Assertion is false but reason is true.

Answer: B

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4. Assertion : Zone refining method is very useful for roducing semiconductors.

Reason: Semiconductors are of high purity.

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

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

C. Assertion is true but reason is false.

D. Assertion is false but reason is true.

Answer: B

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

Reason: Copper is extracted by hydrometallurgy.

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

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

C. Assertion is true but reason is false.

D. Assertion is false but reason is true.

Answer: B

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Section D Ncert Exemplar Solutions Long Anser Type Question

1. Explain the following:

(a) CO_2 is a better reducing agent below 710 K whereas CO is a better reducing agent above 710 K.

(b) Generally sulphide ores are converted into oxides before reduction.

(c) Silica is added to the sulphide ore of copper in the reverberatory furnace.

(d) Carbon and hydrogen are not used as reducing agents at high temperatures.

(e) Vapour phase refining method is used for the purification of Ti.

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Section E Darpan S Exam Oriented Mcqs

1. Gemstone is an impure form of .....

A. Cu_2O

B. Cr_2O_3

C. Mn_2O_3

D. Al_2O_3

Answer: D

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2. Chemical reduction is not suitable for .....

A. Conversion of bauxite to aluminium

B. Conversion of cuprite to copper

C. Conversion of haematite to iron

D. Conversion of zinc oxide to zinc

Answer: A

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3. Vacuum distillation is used to refine

A. Cu

B. Sn

C. Ni

D. Hg

Answer: D

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4. Steel containing nickel is used in .....

A. Agricultural tools

B. Machines for grindings

C. In preparation of anchors

D. Pendulums

Answer: D

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5. The element obtained by auto reduction process is .....

A. Zn

B. Fe

C. Ni

D. Cu

Answer: D

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6. In the cyanide process for extraction of gold and silver from ores, the cyanide solution acts as a.....

A. leaching agent to bring ores into solution.

B. leaching agent to dissolve all other constituents of ores leaving the gold and silver as mtals.

C. leaching agent to bring the gold and silver into solution as cyanide compexes and thus seperate these metals from the ores.

D. reducing agent to reduce the gold and silver compounds present in the ores into the metallic states.

Answer: C

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7. Froth stabilizers in froth floatation process is...

A. Cresol

B. Pine oil

C. Sodium ethyl xanthate

D. Cyanide complex of sodium

Answer: A

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8. The purest form of iron is

A. Pig iron

B. White cast iron

C. Malleable iron

D. Grey cast iron

Answer: C

View Text Solution

9. The extraction of which element involves the formation of complex compound ?

A. Zn

B. Ag

C. Hg

D. Cu

Answer: B

View Text Solution

10. During leaching of bauxite, hydroxides of which elements are precipitated ?

A. Fe and Al

B. Fe and Ti

C. Ti and Cu

D. Zn and Ti

Answer: B

View Text Solution

11. The function of flux is.....

A. to carry out reduction.

B. to carry out oxidation.

C. to remove impurities.

D. to make free energy change of the reaction negative.

Answer: C

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12. During the extraction of copper, the concentrated ore is roasted so to remove the impurities of .. ..

A. As and Sb

B. Sb and Fe

C. Fe and As

D. Fe and s

Answer: A

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13. For the reaction :

$2Cl^-_{(aq)} + 2H_2O_{(l)} \rightarrow 2OH^-_{(aq)} + H_2 + Cl_{2(l)}$ The free energy change is equal to .....

A. $-242kJ$

B. $+242kJ$

C. $+422kJ$

D. $-422kJ$

Answer: C

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14. Thomas slag is prepared by reaction between...

A. MnO and SiO_2

B. Cao and SiO_2

C. CaO and $P4O_{10}$

D. FeO and SiO_2

Answer: C

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15. Bauxite No

$$\xrightarrow[N_2]{+C} \underset{CO}{AIN} \xrightarrow{H_2O} Al(OH)_3 \xrightarrow{\Delta} Al_2O_3 + NH_3$$

The flow sheet is for .....

A. Bayer's process

B. Serpeck's process

C. Hall-Heroult process

D. Kroll's process

Answer: B

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16. Goldschmidt thermite process is used for .. .

A. welding of broken iron pieces.

B. converting iron into steel.

C. extraction of sulphur.

D. reduction of metallic oxide by magnesium

Answer: A

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17. Which of the following oxide is reduced by an acceptance of electrons ?

A. Fe_2O_3

B. Al_2O_3

C. ZnO

D. PbO

Answer: B

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18. In which of the following do the ranges of temperature play an important role ?

A. Electrolysis

B. Liquation

C. Zone refining

D. Blast furnace

Answer: D

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19. Which principle is involved in chromatography ?

A. Hydration

B. Decomposition

C. Precipitation

D. Adsorption

Answer: D

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20. Cast iron is not used in .....

A. Anchors

B. Stoves

C. Railways

D. Pipes of gutter

Answer: A

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21. The reducing agent in electrolysis of alumina

A. CaF_2

B. Na_2AIF_6

C. Graphite

D. Al_2O_3

Answer: C

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22. Which ore has more than one metal present in it ?

A. Copper pyrite

B. Iron pyrite

C. Calamine

D. Siderite

Answer: A

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23. Copper matte is .....

A. $CuS + Fes$

B. $FeS + Cu_2S$

C. $FeO + Cu_2S$

D. $FeS + Cu_2O$

Answer: B

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24. The methods cheifly used for the extraction of lead and zinc from their ores are respectively

A. self-reduction and carbon reduction.

B. carbon reduction and self-reduction.

C. cyanide process and carbon reduction.

D. carbon reduction and cyanide process.

Answer: A

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25. The ore after concentration is found to have basic impurities. Which of the following can be used as flux ?

A. MgO

B. $CaCO_3$

C. FeO

D. SiO_2

Answer: D

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26. Which of the following metals are extracted by hydrometallurgy?

A. Fe

B. Au

C. Mg

D. Pb

Answer: B

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27. The metallurgical process in which the metal obtained in fused state is called .....

A. Roasting

B. Smelting

C. Froth floatation

D. Calcination

Answer: B

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28. Which of the following acts an activator in froth floatation process ?

A. KCN

B. Sodium methyl xanthate

C. Cresol

D. $CuSO_4$

Answer: D

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29. Which of the following acts as neutral refractories ?

A. Magnesite

B. Dolomite

C. Quartz

D. Chromite

Answer: D

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30. In cyanidation of gold and silver the formation of HCN is prevented by addition of .....

A. H_2SO_4

B. $NaCN$

C. $NaOH$

D. $Pb(NO_3)_2$

Answer: C

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31. CO is used in metallurgy of ..

A. Cu

B. Ni

C. Cr

D. Pt

Answer: B

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32. In blast furnace, Fe_2O_3 is reduced by .....

A. C

B. H_2

C. CO

D. CO_2

Answer: C

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33. Poling process is used .....

A. for removal of Fe_2O_3 from Fe.

B. for removal of Al_2O_3 from Al.

C. for removal of Cu_2O from Cu.

D. for removal of ZnO from Zn.

Answer: C

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34. Alumina with considerable impurity of silica is purified by .....

A. Hall-Heroult process

B. Hoope's process

C. Serpeck's process

D. Bayer's process

Answer: C

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35. Silver with impurity of lead is refined by .....

A. Vapour phase refining

B. Electrolytic refining

C. Cupellation

D. Chromatography

Answer: C

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36. Copper is extracted from its ore copper pyrite throupgh the scheme given below :

$$\text{Copper pyrite} \xrightarrow{\text{Roasting}} \underbrace{X + Y} + SO_2 \uparrow$$

$$+\text{Coke}_{\text{flux}} \downarrow \text{ smelting}$$

$$\underset{\text{Copper metal}}{\text{Crude}} \xleftarrow{\text{Bessemerisation}} \text{Molten matte slag}$$

THe Compound X and Y are respectively.

A. Cu_2S and FeO

B. Cu_2S and Fe_2O_3

C. Cu_2S and FeS

D. Cus and Fes

Answer: C

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37. The formula of azurite is .....

A. $CuCO_3 \cdot Cu(OH)_2$

B. $CuSO_3 \cdot Cu(OH)_2$

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

D. $CuCO_2 \cdot Cu(OH)_2$

Answer: C

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38. A black mineral on roasting breaks up into two compounds A and B with the liberation of gas C. When air is passed through the molten mixture of A and B, B converts into oxide that can be reduced by air. The mineral is .....

A. Chalcocite

B. Feldspar

C. Chalcopyrite

D. Pyrargyrite

Answer: C

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39. In a mixture of PbS, ZnS and FeS_2 each component is separated from other by using the reagents in the following sequence in froth floatation process.

A. Potassium ethyl xanthate, KCN.

B. Potassium ethyl xanthate, KCN, NaOH, copper sulphate, acid.

C. $KCN, CuSO_4$ acid.

D. Potassium ethyl xanthate, copper sulphate, NaOH, KCN, acid.

Answer: B

View Text Solution

40. Speigel, used in the manufacture of steel by the Bessemer process, is an alloy of.....

A. iron, chromium and carbon.

B. iron, manganese and carbon.

C. iron, tungstan and carbon.

D. iron, nickel and carbon.

Answer: B

View Text Solution

41. Chromium is obtained by reducing purified chromite ore with....

A. red hot coke

B. carbon monoxide

C. Al powder

D. $H_{2(g)}$

Answer: C

View Text Solution

42. Process to get pure metals from ores by removing unwanted material or impurity is known as....

A. Metallurgy

B. Electrolysis

C. Reduction

D. Purification

Answer: A

View Text Solution

43. What is the main steps during obtaining metals from ores?

A. Concentration of metal

B. Isolation of metals from concentrated ores

C. Concentration of ores

D. All (A), (B) and (C)

Answer: D

View Text Solution

44. What is the position of Aluminium metal among the metals obtained from the earth crust?

A. Second

B. Third

C. Sixth

D. Fourth

Answer: B

View Text Solution

45. Magnetite is a metal of....

A. Fe

B. Zn

C. Al

D. Cu

Answer: A

View Text Solution

46. Calamine is which type of ore ?

A. Carbonate ores of calcium

B. Sulphide ores of Mg

C. Hydroxide ores of Zn

D. Carbonate ores of Zn

Answer: D

View Text Solution

47. Which ore of copper is iron free?

A. Copper pyrites

B. Copper glans

C. Cuprite

D. Malachite

Answer: A

View Text Solution

48. What is the ore of zinc ?

A. Haematite

B. Copper pyrites

C. Zinc blende

D. Bauxite

Answer: C

View Text Solution

49. Metals obtained from sulphide ores are of least choice, because....

A. these ores are costly.

B. reduction of these ores are difficult.

C. sulphur dioxide gas evolved from them causes pollution.

D. Both (B) and (C)

Answer: D

View Text Solution

50. ..... is a carbonate ore.

A. Pyrolusite

B. Malachite

C. Casiterites

D. Diaspores

Answer: B

View Text Solution

51. ..... possess both copper and iron.

A. Copper pyrites

B. Chalcosites

C. Malachite

D. Cuprite

Answer: A

View Text Solution

52. Arrange the following elements according to their percentage proportion present in earth crust.

A. Al gt Ca gt Fe

B. Al gt Fe gt Ca

C. Ca gt Al gt Fe

D. Fe gt Al gt Ca

Answer: B

View Text Solution

53. When we can apply magnetic field in concentration of ores?

A. Both ores and gange possess attraction towards magnetic field.

B. Both ores and gange do not possess attraction towards magnetic field.

C. Either ores or gange, any one possess attraction towards magnetic field.

D. None of the above.

Answer: C

View Text Solution

54. Which substance is used as collector of sulphide ores in froth floatation process ?

A. Fatty acid

B. Pine oil

C. Xenthate compounds

D. All (A), (B) and (C)

Answer: D

View Text Solution

55. Which substances are used as froth stabilizer in froth floatation process ?

A. Quinol, cresol

B. Cresol, aniline

C. Pine oil, terpentine

D. Quino, aniline

Answer: B

View Text Solution

56. For ..... ores froth floatation process is used.

A. Bauxite

B. Cinnabar

C. Haematite

D. Horn silver

Answer: B

View Text Solution

57.

$4Ag_{(s)} + 8CN^-_{(aq)} + 2H_2O_{(l)} = O_{2(g)} \rightarrow X + OH^-_{(aq)}$

then X = ...

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

B. $\left[Ag(CN)_4\right]^-$

C. $AgCN$

D. $\left[4Ag(CN)_2\right]^-$

Answer: D

View Text Solution

58. Which complex is obtained on reaction of Ag with NaCN ?

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

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

C. $[Ag(CN)]^{-}$

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

Answer: B

View Text Solution

59. Leaching of gold is carried out by.....

A. $CaCN_2$

B. KCN

C. HCN

D. $NaCN$

Answer: B

View Text Solution

60. How concentrate ores of tin containing FeCrO?

A. Froth floatation

B. Magnetic separation

C. Gravitational separation

D. Electrostatic precipitation

Answer: B

View Text Solution

61. Matte is a mixture of....

A. $Cu_2S_2 + FeS$

B. $Cu_2S + Fe_2S$

C. $CuS + FeS$

D. $Cu_2S + FeS$

Answer: D

View Text Solution

62. Roasting is generally carried out in case of....

A. Silicate ores

B. Oxide ores

C. Carbonate ores

D. Sulphide ores

Answer: D

View Text Solution

63. Which of the following equation shows relation between ΔG° and equilibrium constant K?

A. $\Delta G^{\circ} = RT \ln K$

B. $\Delta G^{\circ} = -RT\ln K$

C. $\Delta G^{\circ} = \frac{RT}{n}K$

D. $K = \frac{\Delta G^{\circ}}{RT\ln}$

Answer: B

View Text Solution

64. State the relation between E°_{cell} and equilibrium constant.

A. $E^{\circ}_{\text{cell}} = \frac{RT}{nF}\ln K$

B. $E^{\circ}_{\text{cell}} = -\frac{RT}{nF}\ln K$

C. $E^{\circ}_{\text{cell}} = -\frac{Rt}{nF}\ln K$

D. $E^{\circ}_{\text{cell}} = -\frac{nF}{RT}\ln K$

Answer: A

View Text Solution

65. In which condition reaction become spontaneous ?

A. Value of E° and ΔG° is negative

B. Value of E° and ΔG° is positive

C. Value of E° is negative and ΔG° is positive

D. Value of E° is positive and ΔG° is negative

Answer: D

View Text Solution

66. When iron nail is placed in CuSO4 solution then....

A. oxidation of Fe is not possible.

B. blue color of solution become faint.

C. reduction of Cu^{2+} is not possible.

D. reduction of Fe is possible.

Answer: B

View Text Solution

67. Which of the following metal is purified by distillation method ?

A. Zn

B. Hg

C. Pt

D. Both (A) and (B)

Answer: D

View Text Solution

68. Which principle is used in chromatographic separation ?

A. Adsorption

B. Hydration

C. Precipitation

D. Decomposition

Answer: A

View Text Solution

69. Which of the following metal pairs can be purified by Van-arkel method ?

A. Zr and Ti

B. Ga and In

C. Ni and Fe

D. Ag and Au

Answer: A

View Text Solution

70. Which of the following metal is used as a thin foil in cigarate packet?

A. Al

B. Mg

C. Zn

D. Cu

Answer: A

View Text Solution

71. Which of the following metals are used in alloy like deltametal?

A. Mg

B. Zn

C. Co

D. Cu

Answer: D

View Text Solution

72. Zinc obtained by reduction process from zinc oxide is known by which name?

A. Retort

B. Speltor

C. Blister copper

D. Constantan

Answer: B

View Text Solution

73. Which metal is purified by electrolytic method ?

A. Tin

B. Silicon

C. Zinc

D. Mercury

Answer: C

View Text Solution

Section E Mcqs Asked In Competitive Exam

1. Lithopone, a white pigment, consists of

A. ZnS and $BaSO_4$

B. PbS and MgO

C. Al_2O_3 and $CaCO_3$

D. $BaSO_4$ and $PbSO_4$

Answer: A

View Text Solution

2. Bauxite, an ore of aluminium is purified by

A. Halls' process

B. Serpek's process

C. Bayer's process

D. All of these

Answer: D

View Text Solution

3. Which of the following is a sulphide ore ?

A. Carnallite

B. Magnetite

C. Copper pyrites

D. Malachite

Answer: C

View Text Solution

4. An ore of potassium is

A. Carnallite

B. Cryolite

C. Bauxite

D. Dolomite

Answer: A

View Text Solution

5. In the equation

$$4M + 8CN^- + 2H_2O + O_2 \rightarrow 4\left[M(CN)_2\right]^- + 4OH^-$$

the metal M is....

A. Copper

B. Iron

C. Gold

D. Zinc

Answer: C

View Text Solution

6. Magnetic separation is used in the concentration of...

A. Copper pyrites

B. Bauxite

C. Cassiterite

D. Cinnabar

Answer: C

View Text Solution

7. The metal always found in the free state is .....

A. Au

B. K

C. Cu

D. Na

Answer: A

View Text Solution

8. For which ore of the metal, froth floatation process is used for concentration ?

A. Horn silver

B. Bauxite

C. Cinnabar

D. Haematite

Answer: C

View Text Solution

9. Sulphide ores are generally concentrated by....

A. Froth floatation

B. Roasting

C. Magnetic separation

D. Carbon reduction

Answer: A

View Text Solution

10. In the extraction of copper from sulphide ore the metal is formed by reduction of Cu_2O with

A. FeS

B. CO

C. Cu_2S

D. SO_2

Answer: A

View Text Solution

11. 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. $X: -\left[Au(CN)_2\right]^- Y: \left[Zn(CN)_4\right]^{4-}$

D. $X: -\left[Au(CN)_4\right]^- Y: \left[Zn(CN)_4\right]^-$

Answer: A

View Text Solution

12. Which process of purification is represented by the following scheme?

$$\underset{(\text{Impure})}{Ti} + 2I_2 \xrightarrow{250^\circ C} Ti_4 \xrightarrow{1400^\circ C} \underset{(\text{Pure})}{Ti} + 2I_2$$

A. Cupellation

B. Zone refining

C. Electrolytic refining

D. Van Arkel process

Answer: D

View Text Solution

13. In Hall's process, the main reagent mixed with...

A. NaF

B. Na_3AlF_6

C. AlF_3

D. AlF_6

Answer: B

View Text Solution

14. A : Extraction of iron metal from iron oxide ore is carried out by heating with coke.

R: The reaction $Fe_2O_{3(s)} \rightarrow Fe_{(s)} + \frac{3}{2}O_{2(g)}$ is a spontaneous process.

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

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

C. Assertion is true but reason is false.

D. Assertion is false but reason is true.

Answer: D

View Text Solution

15. Which of the following reaction is proper for ellingham's diagram for graph of ΔG° vs T ?

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

B. $2Ag + \frac{1}{2} O_2 \rightarrow Ag_2O$

C. $C_{(g)} + \frac{1}{2} O_{2(g)} \rightarrow CO_{2(g)}$

D. $CO + \frac{1}{2} O_{2(g)} \rightarrow CO_{(g)}$

Answer: C

View Text Solution

16. Consider the following reactions at $1000^\circ C$

(A) $Zn_{(s)} + \frac{1}{2} O_{2(s)} \rightarrow ZnO_{(s)}$

$\Delta G^\circ = -360 kJmol^-$

(B) $C(\text{graphite}) + \frac{1}{2}O_{2(g)} \rightarrow CO_{(g)}$

$\Delta G^{\circ}, = -460 Jmol^{-1}$

A. Zinc can be oxidised by carbon monoxide.

B. Zinc oxide can be reduced by graphite.

C. Both statement (A) and (B) are true.

D. Both statement (A) and (B) are false.

Answer: B

View Text Solution

17. Extraction of zinc from zinc blende is achieved

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: B

View Text Solution

18. Carbon and Co gas are used to reduce which of the following pairs of metal oxides for extraction of metals?

A. FeO, SnO

B. SnO, ZnO

C. BaO, Na_2O_2

D. FeO, ZnO

Answer: D

View Text Solution

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

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

B. $CO_2 + C \rightarrow 2CO$

C. $CaO + SiO_2 \rightarrow CaSiO_3$

D. $CaO + SiO_2 \rightarrow CaSiO_3$

Answer: C

View Text Solution

20. The method not used in metallurgy to refine the impure metal is .....

A. Mond's Process

B. Van-Arkel process

C. Amalgamation process

D. Zone-refining

Answer: C

View Text Solution

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

A. Hg

B. Cu

C. Pb

D. Fe

Answer: D

View Text Solution

22. The incorrect statement among the following

A. hydrogen is used to reduce NiO

B. zirconium is refined by Van-Arkel method

C. the sulphide ore galena is concentrated by froth floatation process

D. in the metallurgy of iron, the Flux used is SiO_2

Answer: D

View Text Solution

23. The temperature of the Slag zone in the metallurgy of iron using blast furnace is...

A. $1500 - 1600^\circ C$

B. $400 - 700^\circ C$

C. $800 - 1000^\circ C$

D. $1200 - 1500^\circ C$

Answer: C

View Text Solution

View Text Solution

24. Bauxite ore is made up of $Al_2O_3 + SiO_2 + TiO_2 + Fe_2O_3$. This ore is treated with conc. NaOH solution at 500 K and 35 bar pressure for few hours and filtered. The species present in it are...

A. $NaAl(OH)4$ only

B. $NaTi(OH)_6$ only

C. $NaAl(OH)_4$ and Na_2SiO_3 both

D. Na_2SiO_3 only

Answer: C

View Text Solution

25. Which of the processes is used in thermite welding?

A. $TiO_2 + 4Na \rightarrow Ti + 2Na_2O$

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

C. $SnO + 2C \rightarrow Sn + 2Co$

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

Answer: D

View Text Solution

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

A. Electrolysing fused Al_2O_3 and Cryolite

B. By heating $Al_O \_ 3$ with carbon

C. By heating Al_2O_3 in Muffle furnace

D. By a process called pyrometallurgy

Answer: A

View Text Solution

27. German silver is an alloy of...

A. Copper, Zinc, Silver

B. Copper, Zinc and Nickel

C. Copper, Zinc and Tin

D. Manganese, Chromium and Ni

Answer: B

View Text Solution

28. In athe extraction of copper, the copper matte is a mixture is

A. Copper (II) Sulphide and iron (II) Sulphide

B. Copper (II) Sulphide and iron (II) Sulphide

C. Copper (I) Sulphide and iron (II) Sulphide

D. Copper (I) Sulphide and iron (II) Sulphide

Answer: C

View Text Solution

29. In the electrolytic refining of zinc.....

A. graphite is at the anode.

B. the impure metal is at the cathode.

C. the metal ion gets reduced at the anode.

D. acidified zinc sulphate is the electrolyte.

Answer: D

View Text Solution

30. According to Ellingham diagram, the oxidation reaction on the carbon to carbon monoxide may be used to reduce which one of the following oxides at the lowest temperature ?

A. Al_2O_3

B. Cu_2O

C. MgO

D. ZnO

Answer: B

View Text Solution

31. The formula of siderite is.....

A. Fe_2O_3

B. Fe_3O_4

C. FeS_2

D. $FeCO_3$

Answer: D

View Text Solution

32. The metal used to recover copper from a solution of copper sulphate is.....

A. Na

B. Fe

C. Hg

D. Ag

Answer: B

View Text Solution

33. Which of the following represents the composition of Carnallite mineral ?

A. KNO_3

B. $K_2O \cdot Al_2O_3 \cdot 6SiO_2$

C. $K_2SO_4 \cdot MgSO_4 \cdot MgCl_2 \cdot 6H_2O$

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

Answer: D

View Text Solution

34. Bauxite has the composition

A. Al_2O_3

B. $Al_2O_3 \cdot 2H_2O$

C. $Al_2O_3 \cdot 2H_2O$

D. None of these

Answer: B

View Text Solution

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

A. II, III haematite and III in magnetite.

B. II, III in haematite and II in magnetite.

C. II in haematite and II, III in magnetite.

D. III in haematite and II, III in magnetite.

Answer: D

View Text Solution

36. Which of the following is not the correct match ?

A. Leaching : Ag

B. Zone refining : Sn

C. Liquation : Pb

D. Van Arkel : Zr

Answer: B

View Text Solution

37. Oil used as frothing agent in froth floatation process is .....

A. Pine oil

B. Olive oil

C. Mustard oil

D. Turpentine oil

Answer: A

View Text Solution

38. The first step in the extraction of copper is....

A. reduction of copper(I) oxide with copper(I) oxide.

B. roasting of copper(I) oxide.

C. heating ore with coke.

D. reduction with iron.

Answer: B

View Text Solution

39. Which process is used in smelting during metallurgy of copper.

A. Self reduction of copper

B. Reduction of Fe

C. FeS is converted into FeO

D. Cu_2S is converted into Cu_2O

Answer: C

View Text Solution

Section E Mcqs Asked In Jee Neet Aieee

1. Which of the following metal is leached by cyanide process?

A. Ag

B. Na

C. Al

D. Cu

Answer: A

View Text Solution

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

A. Magnetite

B. Siderite

C. Galena

D. Malachite

Answer: C

View Text Solution

3. During the process of electrolytic refining of copper, some metals present as impurity settle as "anode mud." These are .....

A. Sn and Ag

B. Pb and Zn

C. Ag and Au

D. Fe and Ni

Answer: C

View Text Solution

4. Heating Cu_2O and Cu_2S will give :

A. $Cu + SO_2$

B. $Cu + SO_3$

C. $CuO + CuS$

D. Cu_2SO_3

Answer: A

View Text Solution

5. Which of the following statements, about the advantage of roasting of sulphide ore before reduction is not true?

A. The ΔG° of the sulphide is greater than those for CS_2 and H_2S.

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

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

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

Answer: D

View Text Solution

6. 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 pyrite

C. Sphalerite

D. Argentite

Answer: D

View Text Solution

7. In aluminothermic process, Al is used as....

A. reducing agent

B. oxidising agent

C. catalyst

D. electrolyte

Answer: A

View Text Solution

8. Impurities present in the ore react with a substance to from a fusible product known as....

A. flux

B. gangue

C. nugget

D. mineral

Answer: A

View Text Solution

9. Which of the following pairs of metals is purified by Van-Arkel method.

A. Ga and In

B. Zr and Ti

C. Ag and Au

D. Ni and Fe

Answer: B

View Text Solution

10. Which of the following elements is present as the impurity to the maximum extent in the pig iron?

A. Manganese

B. Carbon

C. Silicon

D. Phosphorus

Answer: B

View Text Solution

11. In view of the sign of ΔG° for the following reactions

$PbO_2 + Pb \rightarrow 2PbO, \Delta G^{\circ} < 0$

$SnO_2 + Sn \rightarrow 2SnO, \Delta G^{\circ} > 0$

Which oxidation states are more characteristic for lead and tin ?

A. For lead + 2, for tin + 2

B. For lead + 4, for tin + 4

C. For lead + 2, for tin + 4

D. For lead + 4, for tin + 2

Answer: B

View Text Solution

12. The following reactions take place in the blast furnace in the preparation of impure iron. Identify the reaction pertaining to the formation of the slag.

A. $Fe_2O_{3(s)} + 3CO_{(g)} \rightarrow 2Fe_{(l)} + 3CO_{2(g)}$

B. $CaCO_{3(s)} \rightarrow CaO + CO_{2(g)}$

C. $CaO_{(s)} + SiO_{2(s)} \rightarrow CaSiO_{3(s)}$

D. $2C_{(s)} + O_{2(g)} \rightarrow 2CO_{(g)}$

Answer: C

View Text Solution

13. Which method of purification is represented by the following equation ?

$Ti_{(s)} + 2I_{2(g)} \xrightarrow{525K} Til_{(g)} \xrightarrow{1700K} Ti_{(s)} + 2I_{2(g)}$

A. Cupellation

B. Poling

C. Van Arkel

D. Zone refining

Answer: C

View Text Solution

14. Calamine is an ore of .....

A. Al

B. Cu

C. Zn

D. Fe

Answer: C

View Text Solution

15. In the isolation of metals, calcination process usually results in .....

A. Metal carbonate

B. Metal hydroxide

C. Metal sulphide

D. Metal oxide

Answer: D

View Text Solution

16. 'Metals are usually not found as nitrates in their ores." Out of the following two (I and II) reasons which is / are true for the above observation ?

(I) Metal nitrates are highly unstable

(II) Metal nitrates are highly soluble in water

A. I is false but II is true

B. I and II are false

C. I is true but II is false

D. I and II are false

Answer: A

View Text Solution

17. Extraction of copper by smelting uses silica as an additive to remove .....

A. FeO

B. Cu_2S

C. FeS

D. Cu_2O

Answer: A

View Text Solution

18. The following reaction occurs in the blast furnace where iron ore is reduced to iron metal:

$Fe_2O_{3(s)} + 3CO_{(g)} \Leftrightarrow 2Fe_{(l)} + 3CO_{2(g)}$

Using, Le-chatlier's principle, predict which of the following will not disturb the equilibrium.

A. Addition of CO_2

B. Removal of Fe_2O_3

C. Removal of CO_2

D. Removal of CO

Answer: B

View Text Solution

19. Extraction of gold and silver involves leaching with CN^(-) ion. Silver is latter recovered by....

A. Displacement with zinc

B. Liquation

C. Zone refining

D. Distillation

Answer: A

View Text Solution

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

A. Fe

B. Zn

C. Mg

D. Cu

Answer: C

View Text Solution

21. In the extraction of copper from its sulphide ore, metal is finally obtained by the oxidation of cuprous sulphide with .....

A. CO

B. Cu_2O

C. Fe_2O_3

D. SO_2

Answer: B

View Text Solution

22. The correct statement regarding the given Ellingham diagram is .....

A. At $1400^\circ C$, Al can be used for the extraction of zinc.

B. At $500^\circ C$, coke can be used for extraction of Zn from ZnO.

C. Coke can not be used for the extraction of Cu from Cu_2O

D. At$800^\circ C$, Cu can be used for extraction of Zn from ZnO.

Answer: A

View Text Solution

View Text Solution

23. Match the ores (column-A) with the metals (column-B).

A. A – (2), B – (3), C - (4), D - (1)

B. A - (3), B - (4), C- (1), D - (2)

C. A - (3), B – (4), C- (2), D - (1)

D. A - (1), B - (2), C- (3), D - (4)

Answer: C

View Text Solution

24. Which one is malachite from the following ?

A. $CuCO_3 \cdot Cu(OH)_2$

B. $CuFeS_2$

C. $Cu(OH)_2$

D. Fe_3O_4

Answer: A

View Text Solution

25. The purest form of commercial iron is :

A. Cast iron

B. Wrought iron

C. Pig iron

D. None of these

Answer: B

View Text Solution

Section E Mcqs Asked In Gujet Board Exams

1. During electrolysis of aqueous solution of Na_2SO_4 using graphite electrode .....

A. Concentration of Na_2SO_4 decreases.

B. Concentration of Na_2SO_4 remains constant.

C. Concentration of Na_2SO_4 increases.

D. Concentration of Na_2SO_4 first increases and then decreases.

Answer: C

View Text Solution

2. Which of the following is the alloy of Sn ?

A. Bronze

B. Brass

C. German Silver

D. Stainless steel

Answer: A

View Text Solution

3. Which of the following metal is purified by Mond Carbonyl method ?

A. Zr

B. Ti

C. Ge

D. Ni

Answer: D

View Text Solution

4. Which method is used to get very pure germanium used in semiconductor ?

A. Electrolysis

B. Vapour-phase refining

C. Liquation

D. Zone - refining

Answer: D

View Text Solution

5. Which compound is added as foam stabiliser in froath floatation process?

A. Toluene

B. Benzene

C. Aniline

D. Benzoic acid

Answer: C

View Text Solution

6. Which metal is purified by liquation method ?

A. Sn

B. Si

C. Ni

D. Cu

Answer: A

View Text Solution

7. Which of the following process is for purification of metals?

A. Leaching

B. Washing

C. Liquidation

D. Froath floatation

Answer: C

View Text Solution

8. Which of the following is the Ore of Cu ?

A. Magnetite

B. Malachite

C. Calamine

D. Ciderite

Answer: B

View Text Solution

9. Heating pyrites in air to remove sulphur is known as

A. Roasting

B. Calcination

C. Smelting

D. Bessemerisation

Answer: A

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10. Why does copper become brittle during thermal refining ?

A. Because it produces gas like methane.

B. Because coal is spread on fluid copper.

C. Because cuprous oxide is produced, which dissolves in copper.

D. Because of destructive distillation of branches.

Answer: C

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11. Four equations are given below. Decide if they are correctly balanced or not.

(T for true and F for false)

(i) $M_xO_y + YC \rightarrow xM + YCO$

(ii) $2Al_2O_3 + 3C \rightarrow 4Al + 3CO_2$

(iii) $FeO + SiO_2 \rightarrow FeSiO_3$

(iv) $Cu_2S + 2Cu_2O \rightarrow 6Cu + SO_2$

A. T T T T

B. T T T F

C. T F T F

D. T T F T

Answer: A

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12. Decide X, Y and Z correctly from the given options in the following sentences.

(i) Thermal refining process is used for the refining of X metal.

(ii) Zone refining process is used for purification of Y.

(iii) Dyes can be separated by Z.

A. X = Iron, Y = Ge, Z = Mond Carbonyl process

B. X = Iron, Y = Ge, Z = Van Arkel method

C. X = Copper, Y = Si, Z = Chromatographic method

D. X = Copper, Y = Si, Z = Liquation

Answer: C

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13. The mixture of which of the following is called "Matte"?

A. FeO and SiO_2

B. PbS and Zns

C. Cu_2S and FeS

D. Cu_2S and SO_2

Answer: C

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14. What is the other name of Halic(VII) acid ?

A. Halic acid

B. Hypo Halous acid

C. Halous acid

D. Per Halic acid

Answer: C

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15. By which method oxygen and nitrogen present in the form of impurities in Zirconium are removed ?

A. Van Arkel

B. Roasting

C. Liquation

D. Distillation

Answer: A

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16. Which of the following is not a method of concentration of Ores?

A. Froth floatation

B. Calcination

C. Leaching

D. Hydraulic washing

Answer: B

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17. Zone refining is used to produce very pure.

A. Cu

B. Si

C. Na

D. Zn

Answer: B

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18. An aqueous solution of $0.1MFeCl_3$ is isotonic to which of the following aqueous solutions ?

A. $0.4NBaCl_2$

B. $0.4NAl_2(SO_4)_3$

C. $0.4NNa_3PO_4$

D. $0.4NNaCl$

Answer:

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19. In the thermal refining silicates of which metals float as slag on copper ?

A. Ag, Au & Pt

B. Fe, Bi & Zn

C. Si, As & Bi

D. Sb, Bi & Pt

Answer: B

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20. Which of the following acts as a reducing agent in Hall-Heroult process ?

A. Na_3AlF_6

B. CaF_2

C. Graphite

D. Al_2O_3

Answer: C

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21. The limiting molar conductivities of $KCl, NaCl$ and KNO_3 are 150, 126 and 109 Scm^2mol^{-1} respectively. What is the limiting molar conductivity of $NaNO_3$?

A. $385SCm^2mol^{-1}$

B. $167SCm^2mol^{-1}$

C. $85SCm^2mol^{-1}$

D. $133SCm^2mol^{-1}$

Answer: C

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22. Mention the reaction representing example of leaching.

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

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

C.

$$4M + 8CN^- + 2H_2O + O_2 \rightarrow 4\left[M(CN)_2\right]^- + 4OH^-$$

D. $ZnCO_3 \xrightarrow{\Delta} ZnO_{(s)} + CO_{2(g)}$

Answer: C

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23. What is called the study of metallurgy with change in temperature ?

A. Pyrometallurgy

B. Metallo metallurgy

C. Ferrometallurgy

D. Thermo metal

Answer: A

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24. Which metal is used in galvanizing ?

A. Zinc

B. Aluminium

C. Iron

D. Copper

Answer: A

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25. "Matte" is a mixture of .....

A. $Cu_2S + ZnS$

B. $PbS + ZnS$

C. $Cu_2S + FeS$

D. $FeO + SiO_2$

Answer: C

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26. Read the following statement and choose the correct option.

(1) Alnico and aluminium bronze are used in preparation of parts of the aeroplanes.

(2) Copper is used in the preparation of tubes of boiler, Deltametal and Muntz metal.

(3) Copper and Aluminium forms alloys like duralumin and aluminium bronze.

(4) Copper and Zinc are used in the preparation of German Silver.

A. T F T T

B. T T F T

C. T F F T

D. T F T F

Answer: B

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27. Which is the ore of iron ?

A. Calamine

B. Haematite

C. Bauxite

D. Malachite

Answer: B

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28. Gemstone is the impure form of which compound?

A. Al_2O_3

B. Cu_2O

C. Cr_2O_3

D. Mn_2O_3

Answer: A

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29. By which substance silver is leached ?

A. KCN

B. $NaCN$

C. $Zn(CN)_2$

D. $\left[Zn(CN)_4\right]^{2-}$

Answer: B

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30. Which substance is used as adsorbent in chromatographic method ?

A. Al_2O_3

B. SiO_2

C. MgO

D. All the given

Answer: A

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31. Which metal is mainly present in the impure form in Cu obtained by Bessemerisation process ?

A. S

B. Fe

C. Pt

D. (A) and (B)

Answer: D

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32. Which metal is used in preparation of tubes of boiler?

A. Mg

B. Cu

C. Pt

D. Ni

Answer: B

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33. Which of the following pairs is proper for the method used in Column - I and metal obtained in Column-II ?

Column -I	Column-II
(P) Distillation	(X) Cu
(Q) Smelting	(Y) Hg
(R)Electrolysis	(Z) Sn

A. $P \rightarrow X, Q \rightarrow Y, R \rightarrow Z$

B. $P \rightarrow Y, Q \rightarrow Z, R \rightarrow X$

C. $P \rightarrow Y, Q \rightarrow X, R \rightarrow Z$

D. $P \rightarrow Z, Q \rightarrow X, R \rightarrow Y$

Answer: B

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34. Select the suitable choice by comparing Column-I with II.

Column-I	Column-II
(X) Cryolite	$(M) Na[Al(OH_4)]$
(Y) Sodium-Aluminate	$(N) [Al_2(OH)_4, Si_2O_3]$
(Z) Kaolinite	$(P) Na[Al_2(OH)_3 Si_2O_3]$
	$(Q) Na[Al_2(OH)_3 Si_2O_3]$
	$(R) Na_3[AlF_4]$

A. $X \rightarrow R, Y \rightarrow P, Z \rightarrow Q$

B. $X \rightarrow R, Y \rightarrow Q, Z \rightarrow N$

C. $X \rightarrow R, Y \rightarrow M, Z \rightarrow N$

D. $X \rightarrow R,\ Y \rightarrow P, Z \rightarrow N$

Answer: A

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35. Match Column-A and Column-B.

A	B
(P)Distillation	(x) Titanium
(Q) Van arkel	(Y) Zinc
(R) Mond carbonyl	(Z) Nickel

A. $P \rightarrow X, Q \rightarrow Y, R \rightarrow Z$

B. $P \rightarrow Z, Q \rightarrow Y, R \rightarrow X$

C. $P \rightarrow Y, Q \rightarrow Z, R \rightarrow Z$

D. $P \rightarrow Y, Q \rightarrow Z, R \rightarrow X$

Answer: C

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36. The impurity of which element is present in Ruby and Sapphire respectively.

A. Cd, Cr

B. Cr, Cd

C. Sr, Br

D. Ni, Cu

Answer: B

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37. Zirconium can be refined by using....

A. Zone refining

B. Van Arkel method

C. Mond carbonyl process

D. Liquation

Answer: B

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38. What is IUPAC name of $Na\left[Al(OH)_4\right]$?

A. Sodium aluminium hydroxide.

B. Sodium tetra hydro aluminate (III)

C. Sodium tetra hydro aluminate (II)

D. Sodium aluminate.

Answer: B

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39. Which sulphide ore removed by adding NaCN as depressant in froth floatation method ?

A. $PbS + CuS$

B. $CuS + ZnS$

C. $ZnS + PbS$

D. All the given

Answer: C

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40. What would be the change in no. of electron, when silver and gold is obtained by eduction of its ion on adding Zinc respectively ?

A. (2, 1)

B. (1, 3)

C. (2, 2)

D. (3, 1)

Answer: C

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41. The Zinc metal that we get on commercial basis is called....

A. Zincite

B. Blister

C. Spelter

D. None of these

Answer: C

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42. Which of the following ore is oxide ore ?

A. Malachite

B. Cuprite

C. Calamine

D. Zinc blende

Answer: B

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43. Which of the following two substances react to form Blister copper?

A. $Cu_2 + FeS_2$

B. $Cu_2S + O_2$

C. $Cu_2O + FeS$

D. $Cu_2S + Cu_2O$

Answer: B

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44. Which method is used in refining of Titanium method ?

A. Zone refining

B. Mond carbonyl

C. Frasch method

D. Van Arkel

Answer: D

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45. Which metal can be purified by liquation ?

A. Tin

B. Iron

C. Lead

D. Nickel

Answer: A

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46. Which method is not used for concentration of ores ?

A. Magnetic seperation

B. Froth floatation

C. Smelting

D. Hydraulic washing of complex

Answer: C

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