CHEMISTRY

JEE MAIN AND ADVANCED

GENERAL PRINCIPLES AND PROCESSES OF ISOLATION OF ELEMENTS

Example

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

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2. Write the name and formula 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. Write two points of similarities 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 ΔG (oxide formation) show positive slopes 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 records 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 temperatures being = 870 K and 2070 K.

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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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Try Yourself

1. Match the following

Column I	Column I
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 chemical is most commonly used as collector in froth floatation process ?

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9. Why are sulphide ores converted to oxide form before reduction to metal ?

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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) ?

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

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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 man 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 is the impure copper collected from Bessemer converter commonly called as ?

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20. Name and formulate the main 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. Name two metal which are 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. Impure metal $'A'$ is to be purified by electro-refining method. At which position is this impure metal placed in the electrolytic cell ?

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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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Exercise

1. Concentration of copper glance is done by

A. Leaching

B. Magnetic separation

C. Hydraulic washing

D. Froth Floation method

Answer: D

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2. Leaching is used for the concentration of

A. Ag

B. Au

C. Al

D. All of these

Answer: D

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3. Concentrated ore, calamine is heated to get metal oxide and the volatile impurities escapes away. This process is called

A. Roasting

B. Calcination

C. Reduction

D. Oxidation

Answer: B

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4. The most commonly used reducing agent is

A. B

B. C

C. Al

D. Fe

Answer: B

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5. In the froth floatation process the collectors such as pine oils and xanthates etc. enhance

A. Non-wettability of the mineral particles in froth

B. Non-wettability of the mineral particles in water

C. Non-wettability of the gangue particles in froth.

D. Non-wettability of the gangue particles in water

Answer: B

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6. $2PbS + 3O_2 \rightarrow 2PbO + 2SO_2$

The above process is callled

A. Roasting

B. Calcination

C. Smelting

D. Leaching

Answer: A

7. In the metallurgy of iron, limestone is added to the ore. Why?

A. Reducing agent

B. Oxidising agent

C. Slag

D. Flux

Answer: D

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8. The plot of ΔG versus temperature for the formation of oxides of elements is called

A. Ellingham diagram

B. Free energy curve

C. Entropy curve

D. Isobar

Answer: A

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9. Identify the decreasing order of carbon content in different forms of iron.

A. Wrought iron gt Pig iron gt Cast iron

B. Pig iron gt Cast iron gt Wrought iron

C. Cast iron gt Pig iron gt Wrought iron

D. Cast iron gt Wrought iron gt Pig iron

Answer: B

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10. The pair having oxide and carbonate ore respectively

A. Chromite, Pyrolusite

B. Cassiterite, Calamine

C. Haematite, Galena

D. Malachite, Bauxite

Answer: B

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11. In the electrolytic refining of Cu

A. Impure metal is made as anode and pure metaforme cathode

B. Impure metal foms cathode and pure metal forms anode

C. Pure metal forms both anode and cathode

D. Cu motal is not used as electrodes

Answer: A

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12. Si is refined by

A. Vapour phase refining

B. Zone refining

C. Liquation

D. van Arkel method

Answer: B

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13. Vapour phase refining

A. In

B. Ni

C. Zn

D. Hg

Answer: B

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14. Chromatography is based on the principle of selective _____.

A. Adsorption

B. Absorption

C. Concentration

D. Vaporisation

Answer: A

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15. Refiring of Zn is done using the proces called

A. Electrolytic refining

B. Distillation

C. Liquation

D. Both (1) & (2)

Answer: D

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16. In column chromatography, the moving phase is:

A. Component more soluble in stationary phase take longer time to travel through it

B. Componentes soluble in stationary phase takes longer time to travel through it

C. Both components with same speed initially and then their speed changes

D. Solubility has no effect for the process of chromatography

Answer: A

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17. Solidited Cubained from the reverberatory tumaca has bied appearance. This is due to

A. Evolution of CO_2 gas

B. Evolution of SO_2 gas

C. Due to evaporation of volatile materials

D. Evolution of NO_2

Answer: B

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18. Poling is used for the purification of:

A. Oxidise impurities present in stor copper

B. Reduce impurities present in blister copper

C. Reduce impurities using carbon

D. Remove impurities in the form of slag

Answer: B

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19. Sodium, Magnesium and Aluminium can be obtained from their are by

A. Electrometallurgy

B. Pyrometalurgy

C. Hydrometallurgy

D. Smelting

Answer: A

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20. Which of the following pair can be refined using some basic principle?

A. Cu,Ag

B. Si,Ge

C. Ti,Ni

D. All of these

Answer: D

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Assignment Section A Objective Type Question

1. Which metal is used for extraction of Au and Ag and also for glavanisation of iron objects ?

A. Mg

B. Zn

C. Cr

D. Co

Answer: B

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2. Which of the following is not correctly matched?

A. $Chalcopyrites \rightarrow CuFeS_2$

B. $Smithsonite \rightarrow ZnCO_3$

C. $Mag \neq tite \rightarrow Fe_3O_4$

D. $Ar \geq ntite \rightarrow Na_3AlF_6$

Answer: D

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

A. Bauxite

B. Cryolite

C. China clay

D. Malachite

Answer: D

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4. Which is acidic flux ?

A. CaO

B. MgO

C. SiO_2

D. All of these

Answer: C

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5. In the metallurgy of iron, the slag is

A. $FeSiO_3$

B. $CaCO_3$

C. $CaSiO_3$

D. CaO

Answer: C

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

A. Pyrolusite MnO_2

B. Chromite are $FeOCr_2O_3$

C. Magnetite Fe_3O_4

D. All of these

Answer: D

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7. Which of the following is commonly used to produce form in froth floatation process ?

A. Pine oil

B. Cresol

C. NaCN

D. Xanthate

Answer: A

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

A. NaOH

B. Na_2CO_3

C. $N_2 + C$

D. $CaCO_3$

Answer: C

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9. A sulphide ore is converted into metal oxide by the process of:

A. Calcination

B. Roasting

C. Smelting

D. Leaching

Answer: B

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10. Which of the following metal oxides are reduced by self-reduction method ?

A. HgO

B. Cu_2O

C. PbO

D. Al_2O_3

Answer: D

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11. Which of the following is used as reducing agent in Goldschmidt method?

A. Al

B. k

C. C

D. Mg

Answer: A

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

A. C

B. Al

C. Mg

D. H_2

Answer: C

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

A. Oxides

B. Halides

C. Sulphides

D. All of these

Answer: D

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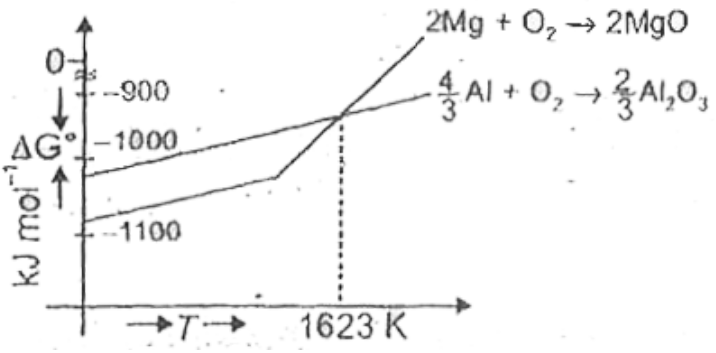
14. Which of the following statement is correct w.r.t. the following graph?



A. Below 1623 K. Mg reduces Al_2O_3

B. Above 1623 K. Al reduces MgO

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

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

Answer: C

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15. In Elingham diagrams of ΔG de formation Vs T, which of the following graphs has negative slope?

A. $C \rightarrow CO$

B. $Fe \rightarrow Fe_2O_3$

C. $M > oMgO$

D. All of these

Answer: A

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16. The form of iron obtained from blast furnace is:

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

B. Zone of heat absorption:

$CO_2 \rightarrow C + O_2$

C. Zone of slag formation:

$CaO + SiO_2 \rightarrow CaSiO_3$

D. Zone of reduction:

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

Answer: B

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17. Which of the following has lowest percentage of carbon?

A. Pig iron

B. Cast iron

C. Wrought iron

D. Haematte

Answer: C

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18. Why partial roasting of sulphide ore is done in the metallurgy of copper ?

A. Muffle furnace

B. Bessemer converter

C. Blast fumace

D. Reverberatory furnace

Answer: D

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19. Zinc is extracted from zinc blende by

A. Carbon reduction process

B. Nitrogen reduction process

C. Oxygen reduction process

D. All of these

Answer: A

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

A. Ore of AI:

B. Ore of Ou

C. Ore of Ag

D. Ore of Zn

Answer: C

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21. Hall-Heroult method is used during extraction of :-

A. Ti

B. Al

C. Au

D. Zn

Answer: B

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22. Poling is used for the purification of:

A. Metal sulphides

B. Metal carbonates

C. Metal bicarbonates

D. Metal oxides

Answer: D

23. Impure zinc, as collected from earthen clay retort, is called

A. Blister zinc

B. Pig Zinc

C. Zinc spelter

D. Cast zinc

Answer: C

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

A. Roasting

B. Calcination

C. Dressing

D. Smelting

Answer: B

25. Extraction of zinc from zinc blende

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

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26. Which of the following metal is purified by distilation process?

A. Zn

B. Fe

C. Al

D. Cu

Answer: A

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

A. Ni

B. Zr

C. Ti

D. All of these

Answer: D

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28. Which of the following gives metal by electrolytic reduction conveniently and profitably?

A. PbO

B. Fe_2O_3

C. Cr_2O_3

D. Al_2O_3

Answer: D

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29. Which of the following organometallics is used in the purification of the metal centre ?

A. Liquation

B. Distillation

C. Zone refining

D. Galvanisation

Answer: D

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30. Which of the following metals is obtained by the self reduction process?

A. Pb

B. Hg

C. Cu

D. All of these

Answer: D

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Assignment Section B Objective Type Question

1. Which of the following metal can be extracted without using reducing agent?

A. Sn

B. Pb

C. Fe

D. Both (1) & (2)

Answer: B

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2. Which of the following metal is extracted by using coke and carbon monoxide as reducing agent?

A. Na

B. Cu

C. Fe

D. Al

Answer: C

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

A. Pb

B. Zn

C. Mn

D. Ag

Answer: D

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4. A Substance which reacts with gangue to form fusible material is called

A. Flux

B. Catalyst

C. Ore

D. Siag

Answer: A

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5. Electrolytic reduction method is used fro the extraction of

A. Highly electronegative elements

B. Transition metals

C. Highly electropositive elements

D. Metalloids

Answer: C

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6. Cyanide process is used for the extraction of

:

A. Au

B. Cu

C. Zn

D. Fe

Answer: A

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7. Calcination is the process in which

A. Heating the are in presence of air

B. Heating the one in absence of air

C. Heating in vacuum

D. Heating of are in presence of N_2

Answer: B

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

A. Pb

B. Al

C. Hg

D. Zn

Answer: B

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9. Which of the following is not a refining process?

A. Mond's process

B. Van Anical process

C. Poling

D. Laaching

Answer: D

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10. Which of the following is not a concentration technique?

A. Levigation

B. Froth-flotation

C. Leaching

D. Calcination

Answer: D

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11. The Ores that are concentrated by Froth flotation method

A. Carbonate

B. Sulphides

C. Oxides

D. Phosphates

Answer: B

12. In blast furnace, iron oxide is reduced by

A. Silica

B. CO

C. H_2S

D. Lime stone

Answer: B

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13. Complexes formed in the cyanide process are:

A. $Na_2[Ag(CN)]$

B. Na[AgCN]

C. $Na_2\left[Ag(CN)_2\right]$

D. $Na\left[Ag(CN)_2\right]$

Answer: D

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14. Zincile and colamine respectively are

A. Oxide and carbonate ore al Zn

B. Carbonate and oxide ore of Zn

C. Oxide and sulphate or of Zn

D. Sulphate and sulphite gre of Zn

Answer: D

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15. Which of the following is chalcopyrite?

A. $CuFeS_2$

B. FeS_2

C. $kMgCl_{36}H_2O$

D. $Al_2O_{32}H_2O$

Answer: A

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16. The alloy used in dental filling contains

A. Ag and Sn

B. Ag and Sb

C. Hg. Ag and Sn

D. Hg. Ag and Sb

Answer: C

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17. What will happen, anode is made of nickel instead af graphite in the extraction of aluminium from $AICl_3$?

A. Nickel will be affected by high temperature

B. Nickel will combine with Cl_2

C. Nickel is insulator

D. Al of these

Answer: B

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18. When molten NaCl is electrolysed by using inert electrode, the product obtained al cathode is

A. Na

B. Cl_2

C. H_2

D. Na Hg amalgam

Answer: A

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19. What is the slag formed from P_2O_5 impurity in metallurgy of iron?

A. $Ca_3(PO_4)_2$

B. $CaSiO_3$

C. $Fe_3(PO_4)_2$

D. $FeSiO_3$

Answer: A

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20. Extraction of zinc from zinc blende

A. Electrolytic reduction

B. Roasting followed by reduction with carbon

C. Calcination followed by reduction with carbon

D. Roasting followed by the reduction

Answer: B

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

A. Distillation

B. Oxidation

C. Electrolytic refining

D. Dissolving in HNO_3

Answer: A

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22. Which of the following oxide is thermaly least stable?

A. CaO

B. Al_2O_3

C. Fe_2O_3

D. Ag_2O

Answer: D

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23. Thomas slag is

A. Calcium slicate

B. Anode mud

C. $FeSiO_3$

D. Calcium phosphate

Answer: D

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24. Which of the following will give respective metal by self reduction ?

A. Galena PbS

B. HgS

C. ZnS

D. Both (1) &(2)

Answer: D

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25. Which of the following statement is incorrect?

A. Al_2O_3, cannot be reduced into Al by Cr_2O_3

B. Ca is stronger reducing agent than Mg

C. At 673 k, CO is poor reducing agent than carbon

D. All of these

Answer: C

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Assignment Section C Previous Years Question

1. Extraction of gold and silver involves leaching with CN^- ion.silver is later recovered

by:

A. Liquation

B. Distillation

C. Zona refining

D. Displacement with Zn

Answer: D

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2. Match the following

Column I		Column II	
(a)	Cyanide process	(i)	Ultrapure Ge
(b)	Froth floatation process	(ii)	Dressing of ZnS
(c)	Electrolytic reduction	(iii)	Extraction of Al
(d)	Zone refining	(iv)	Extraction of Au
		(v)	Purification of Ni

A. (a)(iii),b(iv),c(v),d(i)

B. (a)(iv),b(ii),c(iii),d(i)

C. (a)(ii),b(iii),c(i),d(v)

D. (a)(i),b(ii),c(iii),d(iv)

Answer: B

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3. Aluminium is extracted from Alumina (Al_2O_3) by electrolysis of a molten mixture of

A. $Al_2O_3 + Na_3AlF_6$

B. $Al_2O_3 + KF + Na_3AlF_6$

C. $Al_2O_3 + HF + NaAlF_4$

D. $Al_2O_3 + CaF_2 + NaAlF_4$

Answer: A

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4. In the extraction of copper from its sulphide ore, the metal finally obtained by the reduction of cuprous oxide with -

A. Iron sulphide (FeS)

B. Carbon monoxide(CO)

C. Copper(I)sulphide(Cu_2S)

D. Sulphur dioxide(SO_2)

Answer: C

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5. Identify the alloy containing a non metal as a constituent in it

A. Bell metal

B. Bronze

C. Invar

D. Steel

Answer: D

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6. Which ore of the following is a mineral of iron ?

A. Pyrolusite

B. Magnetite

C. Malachite

D. Cassiterite

Answer: B

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7. Which of the following pairs of metals uis purified by van arkel method?

A. Ni and Fe

B. Ga and In

C. Zr and Ti

D. Ag and Au

Answer: C

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

A. Phosphorus

B. Manganese

C. Carbon

D. Silicon

Answer: C

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9. 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. $CaO(s) + SiO_2(s) \rightarrow CaSiO_3(s)$

B. $2C(s) + O_2(g) \rightarrow 2CO(g)$

C.

$$Fe_2O_3(s) + 3CO(g) \rightarrow 2Fe(l) + 3CO_2(g)$$

D. $CaCO_3(s) \rightarrow CaO(s) + CO_2(g)$

Answer: A

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10. Match the following

	List - I (Substances)		List - II (Processes)
a.	Sulphuric acid	(i)	Haber's process
b.	Steel	(ii)	Bessemer's process
c.	Sodium hydroxide	(iii)	Leblanc process
d.	Ammonia	(iv)	Contact process

A. (a)(i),b(iv),c(ii),d(iii)

B. (a)(i),b(ii),c(iii),d(iv)

C. (a)(iv),b(iii),c(ii),d(i)

D. (a)(iv),b(ii),c(iii),d(i)

Answer: D

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

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

B. Carbon and hydrogen are suitable reducing agents for metal sulphides

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

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

Answer: B

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12. Sulphide ores of metals are usually concentrated by forth floation proces. Which one of the following sulphide ores offers an

exception and is conventrated by chemical leaching'

A. Sphaterite

B. Argentile

C. Galena

D. Copper pynite

Answer: B

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13. The mass of carbon anode consumed (giving only carbon dioxide) in the production of $270kg$ of aluminium metal from bauxite by the Hall process is (Atomic mass: $Al = 27$):

A. 180 kg

B. 270 kg

C. 540 kg

D. 90 kg

Answer: D

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14. In which of the following processes, fused sodium hydroxide is electrolysed at a $333^{\circ}C$ temperature for extraction of sodium

A. Castner process

B. Cyanide process

C. Down's process

D. Both (2) & (3)

Answer: C

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15. Which of the following does not contain aluminium?

A. Cryolite

B. Fluorspar

C. Feldspar

D. Mica

Answer: B

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16. Which of the following does not contain Mg?

A. Magnetite

B. Asbestos

C. Magnesite

D. Canalile

Answer: A

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17. Carborundum is a

A. CaC_2

B. $CaCO_3$

C. Fe_3C

D. SiC

Answer: D

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18. In the basic Bessemer process for the manufacture of steel, the lining of the converter is made up of ____. The slag formed consists of ____.

A. Steel

B. Wrought iron

C. Pig iron

D. Cast iron

Answer: A

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19. Mond's process is used for

A. Ni

B. Al

C. Fe

D. Cu

Answer: A

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

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

A. Poling

B. Electro refining

C. Zone refining

D. van Arkel process

Answer: D

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21. Which of the following sulphides when heated strongly in air gives the corresponding metal?

A. CuS

B. Fe_2S_3

C. FeS

D. HgS

Answer: D

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22. The most important ore of tin is

A. Cassiterite

B. Cryolite

C. Malachite

D. All of these

Answer: A

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23. Heating of ore in presence of air to remove sulphure impurities is called

A. Calcination

B. Roasting

C. Smelting

D. None of these

Answer: B

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24. The process used for the extraction of sodium is called :

A. NaCl(aq)

B. NaCl(l)

C. NaOH(aq)

D. $NaNO_3(aq)$

Answer: B

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25. Among the metals $Cr, Fe, Mn, Ti, Ba,$ and Mg, the one that cannot be obtained by reduction of metal oxide by aluminium is

A. Cr

B. Fe

C. Mn

D. Mg

Answer: D

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

A. NaCN

B. NaCl

C. AgCl

D. All of these

Answer: A

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27. Which ore contains both iron and copper?

A. Cuprite

B. Chalcocite

C. Chalcopyrite

D. Malachite

Answer: C

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28. To dissolve argentite ore which of the following is

A. $Na[Ag(CN)_2]$

B. NaCN

C. NaCl

D. HCl

Answer: B

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

A. Wrought iron

B. Cast iron

C. Pig iron

D. Steel

Answer: C

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30. Elements used as semiconductor are purified by

A. Van Arkel method

B. Mond process

C. Distillation

D. Zone refining

Answer: D

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31. Which of the following oxide is least stable?

A. CO_2

B. CO

C. MgO

D. HgO

Answer: D

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32. The underlying of blast furnace is made of

A. Graphite bricks

B. Silica bricks

C. Basic briks

D. Fireclay brickes

Answer: D

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33. Roasting of sulphides gives the gas X as a by product. This is a colourless gas with choking smell of burnt sulphur and causes

great damage to repiratory organs as a result of acid rain. Its aqueous solution is acidic, acts as reducing agent and its acid has never been isolated. The gas X is :-

A. SO_2

B. CO_2

C. SO_3

D. H_2S

Answer: A

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34. Which of the following mineral contains calcium as well as magnesium ?

A. Tridymite

B. Aragonite

C. Dolomite

D. Camalite

Answer: C

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Assignment Section D Assertion Reason Type Question

1. A: Cuprite is concentrated by froth floatation process

R: Cuprite is the sulphide ore.

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion, then mark (1).

B. If both Assertion & Reason are true but the reason is not the correct explanation

of the assertion, then mark (2)

C. If Assertion is true statement but Reason is false, then mark

D. If both Assertion and Reason are false statements, then mark (4)

Answer: D

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2. A: Bauxite is purified by leaching process

R: Aluminium oxide reacts with NaOH to form soluble sodium meta aluminate.

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion, then mark (1).

B. If both Assertion & Reason are true but the reason is not the correct explanation of the assertion, then mark (2)

C. If Assertion is true statement but Reason is false, then mark

D. If both Assertion and Reason are false statements, then mark (4)

Answer: A

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3. A: Calamine and Dolomite are the carbonate ores.

R: Calamine is $ZnCO_3$ whereas Dolomite is $MgCO_3$ $ZnCO_3$

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion, then mark (1).

B. If both Assertion & Reason are true but the reason is not the correct explanation of the assertion, then mark (2)

C. If Assertion is true statement but Reason is false, then mark

D. If both Assertion and Reason are false statements, then mark (4)

Answer: C

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4. A: Roasting process is involved in the metallurgy of Cu from Malachite ore.

R: Roasting is the process of heating the ore in absence of air.

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion, then mark (1).

B. If both Assertion & Reason are true but the reason is not the correct explanation of the assertion, then mark (2)

C. If Assertion is true statement but Reason is false, then mark

D. If both Assertion and Reason are false statements, then mark (4)

Answer: D

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5. A: Metallurgy of Ag from Argentite is known as hydro-metallurgy

R: Argentile is Ag_2S.

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion, then mark (1).

B. If both Assertion & Reason are true but the reason is not the correct explanation of the assertion, then mark (2)

C. If Assertion is true statement but Reason is false, then mark

D. If both Assertion and Reason are false statements, then mark (4)

Answer: B

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6. A: In the manufacturing of iron from hematite, silicon dioxide is added as flux.

R: Limestone is also used as acidic flux in many case.

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion, then mark (1).

B. If both Assertion & Reason are true but the reason is not the correct explanation of the assertion, then mark (2)

C. If Assertion is true statement but Reason is false, then mark

D. If both Assertion and Reason are false statements, then mark (4)

Answer: D

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7. A: Ultrapure metals are obtained by zone refining.

R: Van arkel method is used for purification of titanium

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion, then mark (1).

B. If both Assertion & Reason are true but the reason is not the correct explanation of the assertion, then mark (2)

C. If Assertion is true statement but Reason is false, then mark

D. If both Assertion and Reason are false statements, then mark (4)

Answer: B

8. A: Wrought iron is purest form of iron with respect to other forms.

R: It has less than 0.5% carbon

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion, then mark (1).

B. If both Assertion & Reason are true but the reason is not the correct explanation of the assertion, then mark (2)

C. If Assertion is true statement but Reason is false, then mark

D. If both Assertion and Reason are false statements, then mark (4)

Answer: A

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9. A: Magnesium oxide is used for the lining in stoel making furnace .

R: Magnesium oxides acts as flux

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion, then mark (1).

B. If both Assertion & Reason are true but the reason is not the correct explanation of the assertion, then mark (2)

C. If Assertion is true statement but Reason is false, then mark

D. If both Assertion and Reason are false statements, then mark (4)

Answer: A

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10. A: Aluminium metal is used as a reducing agent for the extraction of metals

R: Aluminium has great affinity for oxygen

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion, then mark (1).

B. If both Assertion & Reason are true but the reason is not the correct explanation of the assertion, then mark (2)

C. If Assertion is true statement but Reason is false, then mark

D. If both Assertion and Reason are false statements, then mark (4)

Answer: A

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

and

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

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion, then mark (1).

B. If both Assertion & Reason are true but the reason is not the correct explanation of the assertion, then mark (2)

C. If Assertion is true statement but Reason is false, then mark

D. If both Assertion and Reason are false statements, then mark (4)

Answer: A

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12. A: Hydrometallurgy is used for extraction of Ag and Au.

R: Hydrometallurgy is different from pyrometallurgy

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion, then mark (1).

B. If both Assertion & Reason are true but the reason is not the correct explanation of the assertion, then mark (2)

C. If Assertion is true statement but Reason is false, then mark

D. If both Assertion and Reason are false statements, then mark (4)

Answer: B

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13. A: Pure silver is obtained by electrolysis of $AgNO_3$ solution

R: In electrolysis impure silver is taken as cathode and pure silver is taken as anode.

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion, then mark (1).

B. If both Assertion & Reason are true but the reason is not the correct explanation of the assertion, then mark (2)

C. If Assertion is true statement but Reason is false, then mark

D. If both Assertion and Reason are false statements, then mark (4)

Answer: C

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14. A:Carbon is used in blast furnace for reuction of Fe_2O_3

B:This process is called smelting.

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion, then mark (1).

B. If both Assertion & Reason are true but the reason is not the correct explanation of the assertion, then mark (2)

C. If Assertion is true statement but Reason is false, then mark

D. If both Assertion and Reason are false statements, then mark (4)

Answer: B

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15. A:In Hall process Aluminium is purified.

B:Al_2O_3(aq)is used in Hall process.

A. If both Assertion & Reason are true and the reason is the correct explanation of the assertion, then mark (1).

B. If both Assertion & Reason are true but the reason is not the correct explanation of the assertion, then mark (2)

C. If Assertion is true statement but Reason is false, then mark

D. If both Assertion and Reason are false statements, then mark (4)

Answer: D