CHEMISTRY

BOOKS - BITSAT GUIDE

METALLURGY

Practice Exercise

1. Amoug the following statements the incorrect one is

A. calamine and siderite are carbonates

B. argentite and cuprite are oxides

C. zinc blende and pyrites are sulphides

D. malachite and azurite are ores of copper

Answer:

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2. Cassiterite is an ore of

A. Mn

B. Ni

C. Sb

D. Sn

Answer:

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3. A metal becomes quite hard due to the presence of small impurity because the impurity

A. reduce the number of mobile electrons

B. reduce the number of slide planes

C. reduce the crystal symmetry

D. change the lattice structure of metals

Answer:

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4. Statement I Nitrate ores are very rar.

statement II Bond dissociation energy of N_2 is very high

Which of these statement (s) is / are true ?

A. Only I

B. Only II

C. Neither (a) nor (b)

D. Both (a) and (b)

Answer:

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5. The metal found always in the free state , is

A. Au

B. Ag

C. Cu

D. Na

Answer:

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6. Which of the following metals is extracted by the electrometallurgical method?

A. Cu

B. Fe

C. Na

D. Ag

Answer:

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

A. their surface do not get easily wetted by water

B. they are light

C. they bear electrostatic charge

D. they are not soluble

Answer:

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8. the pyrometallurgical operations mainly involve the use of

A. complexation

B. high temperature

C. sulphide ores

D. electrolysis

Answer:

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9. Froth floatation process for the concentration of Cu illustrates the practical application of

A. adsorption

B. absorption

C. sedimentation

D. coagulation

Answer:

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

A. NaCN

B. NaCl

C. $BaCl_2$

D. $ZnSO_4$

Answer:

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11. Which of the following ores is not concentrated by froth floatation process?

A. Pyrolusite

B. Pentlandite

C. Zinc blende

D. Copper pyrites

Answer: A

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12. How do we separate two sulphide ores by froth floatation method?

A. By adding pine oil

B. By adding sodium cyanide

C. By adding foaming agent

D. By passing air

Answer:

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13. Commonly used collectors in froth floatation method are

I. pine oil II.cocount oil

III.fatty acids IV. xanthates

A. $I.\ II,$ and III

B. II, III, IV

C. $I, III,$ and IV

D. $I, II,$ and Iv

Answer:

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14. Removal of the unwanted materials from the ore is known as

A. benefaction

B. dressing

C. concentration

D. $\text{Either}(a)\text{or}(b)\text{or}(C)$

Answer:

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15. The process by which ligher earthly particles are made free from heavier particles by washing with water is called

A. leaching

B. levigation

C. benefication

D. Noneof these

Answer:

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16. Which of the following metals is extracted by auto reduction?

A. Zinc

B. Iron

C. copper

D. Aluminium

Answer:

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

A. Fe_2O_3, ZnO

B. PbO, Fe_3O_4

C. Cu_2O, SnO_2

D. CaO, K_2O

Answer:

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18. Which of the following fluxes is used to remove acidic impurities in metallurgical process?

A. Sillica

B. Lime stone

C. Sodium chloride

D. Sodium carbonate

Answer:

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19. Flux is used to

A. remove all impurities from ores

B. reduce metal oxide

C. remove silica

D. remove silica and undesirable metal oxide

Answer:

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20. The process of converting hydrated Alumina into anhydrous Alumina is called

A. roasting

B. smelting

C. dressing

D. calcination

Answer:

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

A. reduction

B. oxidation

C. reduction followed by oxidation

D. oxidation followed by reduction

Answer:

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22. Which one of the following reactions is an example of auto-reduction?

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

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:

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23. To carry out a reduction process, select a temperature so as to make

A. ΔG positive

B. ΔH positive

C. ΔG negative

D. ΔH negative

Answer:

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24. Smelting is involved in

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

B. $2PbS + 3O_2 \xrightarrow{Hear} 2PbO + 2SO_2$

C. $AI_2O_3H_2O \xrightarrow{Hear} AI_2O_3 + 2H_2O$

D. $Zn_2O_3 \xrightarrow{Heat} ZnO + CO_2$

Answer:

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25. Specific gravity of slag is

A. always less than that of molten metal

B. always higher than that of molten metal

C. same as that of molten metal

D. None of the above

Answer:

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26. The least stable oxide among the following is

A. Sb_2O_3

B. Ag_2O

C. CuO

D. ZnO

Answer:

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27. Which of the following statements about the reduction is not true ?

A.

$\Delta_f G^\circ$ of the sulphide is greater than those of CS_2 and H_2S

B. $\Delta_f G^\circ$ is megative for roasting of sulphide ore to oxide

C. Roasting of sulphide to oxide is thermodynamically feasible

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

Answer:

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28. The value of $\Delta_f G^\circ$ for the formation of $Cr_2O_3 \text{is} -540 kJ \text{mol}^{-1} \text{and that of} AI_2O_3 \text{is} -827 kJ \text{mol}^{-1}$.

Is the reduction of Cr_2O_3 with Al is feasible reaction?

A. the data is incomplete

B. The reaction is feasible

C. the reaction is not feasible

D. The reaction may or may not be feasible

Answer:

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29. The minimum voltage required to electrolyse alumina in the Hall-Heroul process is [Given, $\Delta G^{\circ}\_(f)(A1_2O_3) = -1520kJ/mol$ and $\Delta G^{\circ}\_(f)(CO_2) = 394kJ/mol]$

A. $0.8V$

B. $1,60V$

C. $2.8V$

D. $3.0V$

Answer:

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30. Electrolytic refining's is ued to purify which of the following metals?

A. Cu and Zn

B. Ge and Si

C. Zr and Ti

D. Zn and Hg

Answer:

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31. The metal that cannot obtained by electrolysis of an aqueous solution of its salts is :

A. Chlorine

B. Bromine

C. Sodium

D. Aluminium

Answer:

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32. One of the following metals froms a volatile corbony1 compound and this property is taken advantage of its extraction. This metal is

A. Nickel

B. Iron

C. Cobalt

D. Tungsten

Answer:

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33. 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 absorbed on an adsorbent

D. vapours of volatile compound can be decomposed into pure metal

Answer:

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34. In electrorefining of copper,some gold is deposited as

A. anode mud

B. cathode mud

C. cathode

D. electrolyte

Answer:

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

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

A. Zone refining

B. Cupellation

C. Polling

D. van-Arkel

Answer:

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36. Impure nickel can be purified by

A. electrolytic refining

B. Mond-carbonyl process

C. zone-refining process

D. van-arkel process

Answer:

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37. To obtain pure germanium which of the following methods of refining is preferred?

A. Liquation

B. Zone-refining

C. Electrolytic method

D. Poling

Answer:

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38. Mond's process is used for the purification of

A. Ni

B. Ti

C. Zr

D. Hg

Answer:

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39. In the metallurgy of aluminium,

A. AI^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:

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40. Al can be obtained by

A. electrolysis of AI_2O_3 dissolved in Na_3AIF_6

B. heating alumina with cryolite

C. reducing AI_2O_3 by coke

D. reducing AI_2O_3 by chromium

Answer:

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41. Aluminothermic process is used for metallurgy of

A. Pb

B. Ag

C. Al

D. None of these

Answer:

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42. Which of the following furnaces can be used to get above $3000^\circ C$ temperature ?

A. Blast furnace

B. Arc furnace

C. Muffle furnace

D. Reverberatory furnace

Answer:

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43. The process in which $10g$ of green wood is used is

A. poling

B. pickling

C. anodising

D. galvanising

Answer:

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44. The process used to produce tough pitch copper is

A. cupellation

B. distillation

C. poling

D. zone-refining

Answer:

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45. In Mc-Arthur Forrest method silver is extracted from the solution of $Na\left[Ag(CN)_2\right]$ by the use of

A. zinc

B. magnesium

C. copper

D. iron

Answer:

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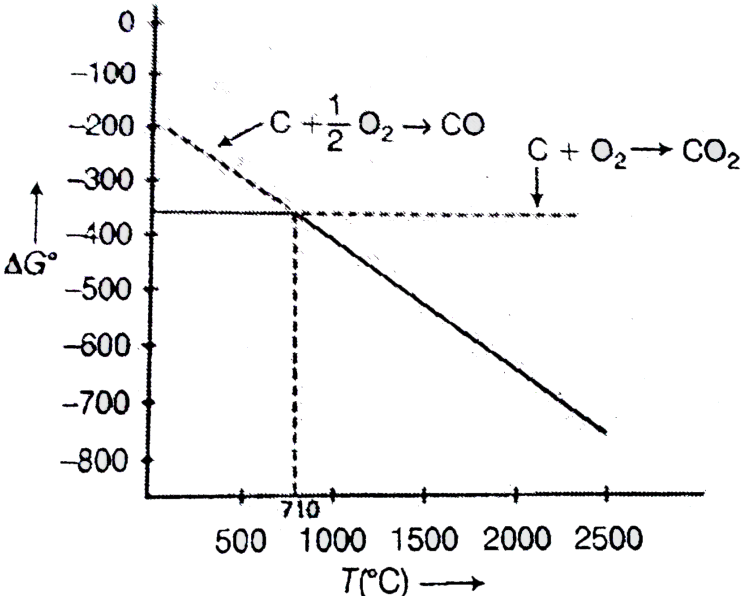
Bitsat Archives

1. Consider the following Ellingham diagram for carbon



Which of the following statements is incorrect for the above Ellingham diagram

A. Upto $710^{\circ}C$, the reaction of formation of CO_2 is energetically more favourable but above $710^{\circ}C$, the formation of CO is preferred

B. Carbon can be used to reduce any metal oxide at a sufficiently high temperature

C. Carbon reduces many oxides at elevated temperature because ΔG° vs temperature line has a negative slope

D. $\Delta S^{\circ}\left[C(s)+\frac{1}{2}O_2(g) \rightarrow CO(g)\right]$

$< \Delta S^{\circ}\left[C(s)+O_2(g) \rightarrow CO(g)\right]$

Answer:

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2. In the extraction of Ag Zn is removed from (Zn-Ag) alloy through

A. cupellation

B. fractional crystallisation

C. distillation

D. electrolytic refining

Answer:

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3. Pyrolusite is a/an

A. oxide ore

B. sulphide ore

C. carbide ore

D. None of the above

Answer:

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4. van-Arkel method is based on

A. cupellation method

B. furnace refining method

C. poling method

D. None of the above

Answer:

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5. Aluminium is present in

A. gypsum

B. carnallite

C. asbestos

D. diaspore

Answer:

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6. The extraction of which of the following metals involves bassemerisation?

A. Fe

B. Ag

C. Al

D. Cu

Answer:

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