CHEMISTRY

BOOKS - BODY BOOKS PUBLICATION

PRODUCTION OF METALS

Example

1. All ores are minerals, but are all minerals ores?

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2. Which metal's ore is calamine?

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3. Which is the ore of aluminium?

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4. Which metals have sulphide ores?

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5. Write suitable method of concentration for the ores given below

A. 1) Tinstone

B. 2) Bauxite

C. 3) Zinc blende

D.

Answer:

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6. Haematitie, magnetite, iron pyrites etc. are the minerals of iron. Which are the ores of iron among these minerals?

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7. Which alloy steel is used for the production of heating coils? Explain the reason.

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8. Even though nichroms and stainless steel contain the same components the posses different properties. Find out the reason.

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9. Which alloy steel is used for making permanent magnets?

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10. How is alumina obtained from thE aluminium hydroxide?

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11. Complete the flow diagram, related to concentration of bauxite, which is given below.

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12. Complete the chemical equation for the reaction taking place when Aluminium hydroxide is heated.

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13. Can we use carbon as the reducing agent for aluminium? Why?

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14. To which electrode does AI^{3+} move?

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15. Complete the flowchart related to the electrolysis of Alumina.

A. * Anode and cathode

B. * Reaction at anode

C. * Reaction at cathode

D.

Answer:

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16. Which of the properties of metals is utilized in the following instances: Aluminium utensils are used for cooking.

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17. Which of the properties of metals is utilized in the following instances: Copper is used for

making vessels.

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18. Which of the properties of metals is utilized in the following instances: Gold wires are used in ornaments.

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19. What are the factors to be considered while selecting minerals for the extraction of

metals?

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20. Write the different stages Involved in metallurgy.

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21. What are the different methods for the refining of metals?

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22. How is iron extracted industrially?

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23. Write the uses of the following: Nichrome

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24. Write the uses of the following: Stainless steel

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25. Write the uses of the following: Alnico

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26. Explain the process of producing alumina from bauxite.

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27. Explain the method of obtaining pure aluminium from alumina by electrolysis. In this process the carbon rods are replaced from time to time. Why?

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28. You know that metals can be separated from molten compounds of metals by electrolysis.

Find out how metals like Na, Ca and Mg are extracted

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29. Complete the table:

Metal	Use	Speciality
Copper	Electric wires	————
Aluminium	————	Thermal conductivity
Iron	————	Hardness
Tungsten	————	Ductility

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30. Features of ore and impurity are given in the table. Write down the method usedfor theseparation of theore.

Ore	Impurity	Method
High density	Low density	(i)
Magnetic	Non Magnetic	(ii)
Low density	High density	(iii)
Dissolved in the solvent	didn't disolve	(iv)

How can we convert ore into its oxide form. Explain with proper examples.

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31. Features of ore and impurity are given in the table. Write down the method usedfor theseparation of theore.

Ore	Impurity	Method
High density	Low density	(i)
Magnetic	Non Magnetic	(ii)
Low density	High density	(iii)
Dissolved in the solvent	didn't disolve	(iv)

$ZnCO_3$ $/Cu_2S$ in this two calcination is used for_____and Roasting is used for__

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32. Features of ore and impurity are given in the table. Write down the method usedfor theseparation of theore.

Ore	Impurity	Method
High density	Low density	(i)
Magnetic	Non Magnetic	(ii)
Low density	High density	(iii)
Dissolved in the solvent	didn't disolve	(iv)

Give Example for reducing agents for reducing oxide ores.

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33. Features of ore and impurity are given in the table. Write down the method usedfor theseparation of theore.

Ore	Impurity	Method
High density	Low density	(i)
Magnetic	Non Magnetic	(ii)
Low density	High density	(iii)
Dissolved in the solvent	didn't disolve	(iv)

Strongest reducing agent.....

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34. Features of ore and impurity are given in the table. Write down the method usedfor theseparation of theore.

Ore	Impurity	Method
High density	Low density	(i)
Magnetic	Non Magnetic	(ii)
Low density	High density	(iii)
Dissolved in the solvent	didn't disolve	(iv)

Which reducing agent used for reducing ZnO, Fe_2O_3, AI_2O_3?

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35. Complete the table:

Process	Metals	Particulars
Liquation	Tin, Lead	(a)
Distillation	Zinc, Cadmium, Mercury	(b)
Eletrolytic refining	Copper, Silver	(c)

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36. Complete the table:

	Method of preparation & Content
Pig iron	.....i.....
Cast iron	.....ii.....
Wrought iron	.....iii.....
Steel	.....iv.....

Stainless steel and Nichrome are having same content `(Fe,Ni,Cr,C). But nature of both alloys are different. Why?

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37. Bauxite and clay are minerals of aluminium. But bauxite is the only ore of Aluminium. Why?

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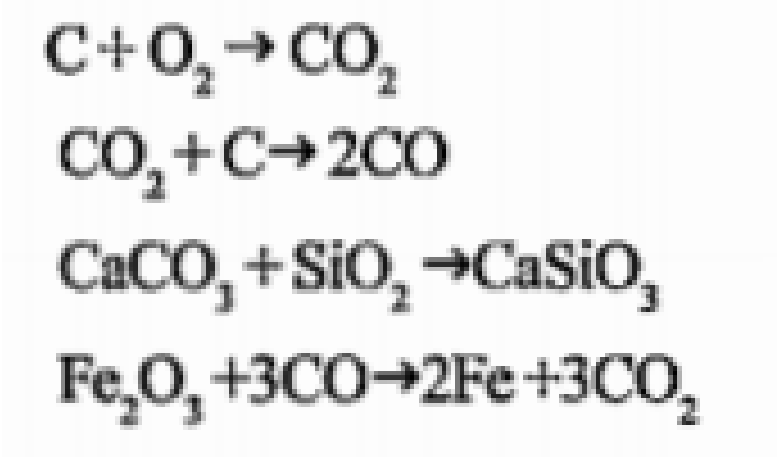
38. Given below are the equations for the reactions taking place inside the blast furnace.



Name the ore of iron.

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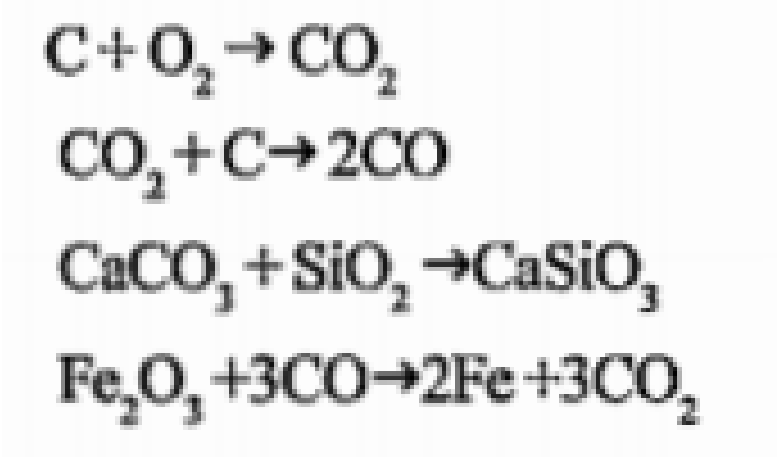
39. Given below are the equations for the reactions taking place inside the blast furnace.



Which is the gangue in iron ore?

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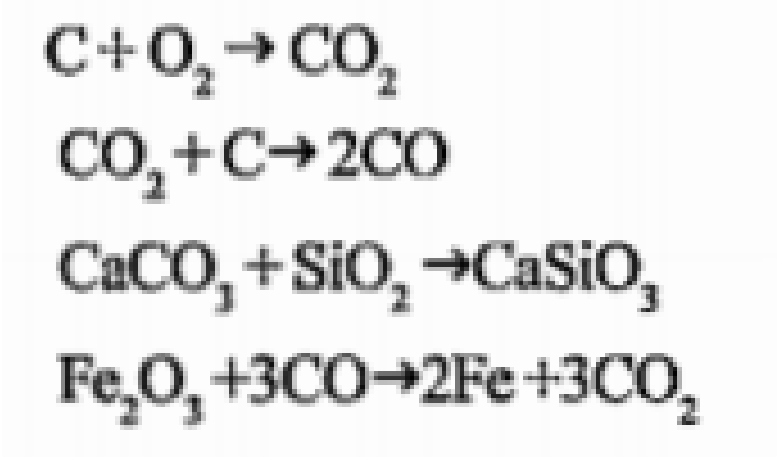
40. Given below are the equations for the reaction taking palce inside the blast furnace.



Name the flux used in blast furnace?

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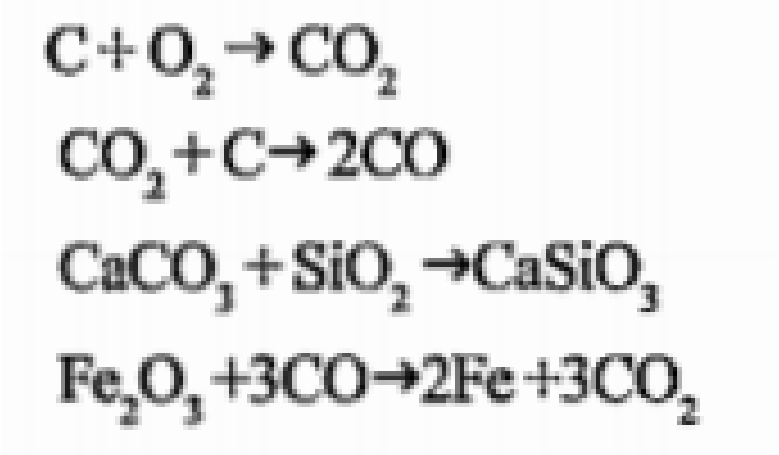
41. Given below are the equations for the reaction taking palce inside the blast furnace.



Gangue+flux $\rightarrow$ _ _ _ _ _ Which product is formed in blast furnace?

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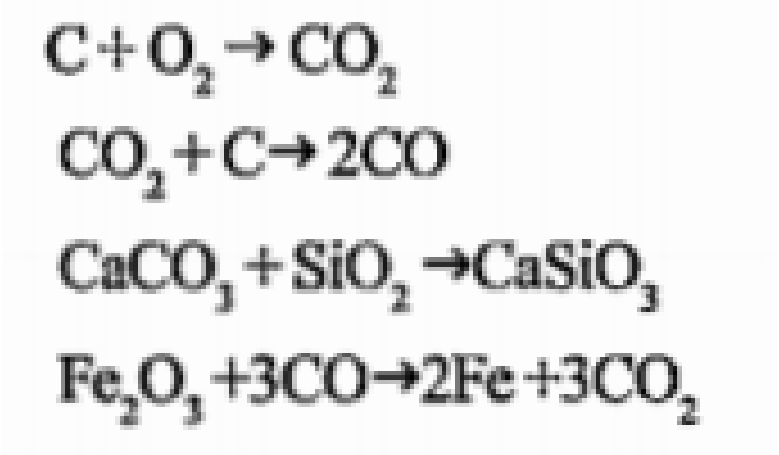
42. Given below are the equations for the reactions taking place inside the blast furnace.



Reducing agent used in blast furnace.

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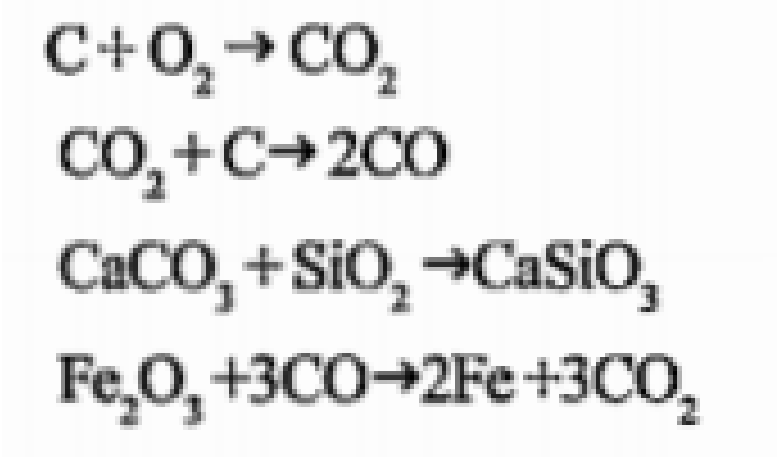
43. Given below are the equations for the reactions taking place inside the blast furnace.



Subjects dropped in blast furnace are _____,_____.

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44. Write down the names of Anode,Cathode, Electrolyte used in the Electrolyte cell for the manufacturing of copper.

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45. Write down the general equations for the reaction in anode and cathode.

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46. Manufacturing of iron: Name the furnace used for production of iron.

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47. Manufacturing of iron: Name the materials using for producing iron.

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48. Manufacturing of iron: Write down the reaction occuring on coke when hot is blasted on it?

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49. Manufacturing of iron: Why $CaCO_3$ is dropping inside the fur-nace?

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50. Manufactruring of iron: Write down the nature of gangue with iron ore.

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51. Manufactruring of iron: Gangue+flux $\rightarrow - - - - - -$ Write down the uses of the product formed in blast furnace.

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52. Manufacturing of iron: Reducing agent in blast furnace.

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53. Manufactruing of iron: Write down the reactions taking place inside the blast furnace.

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54. Manufacturing of iron: Iron formed from the blast furnace is called_____

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55. Manufacturing of iron: How can we change iron into steel?

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56. Manufacturing of iron: What are the different type of steel?

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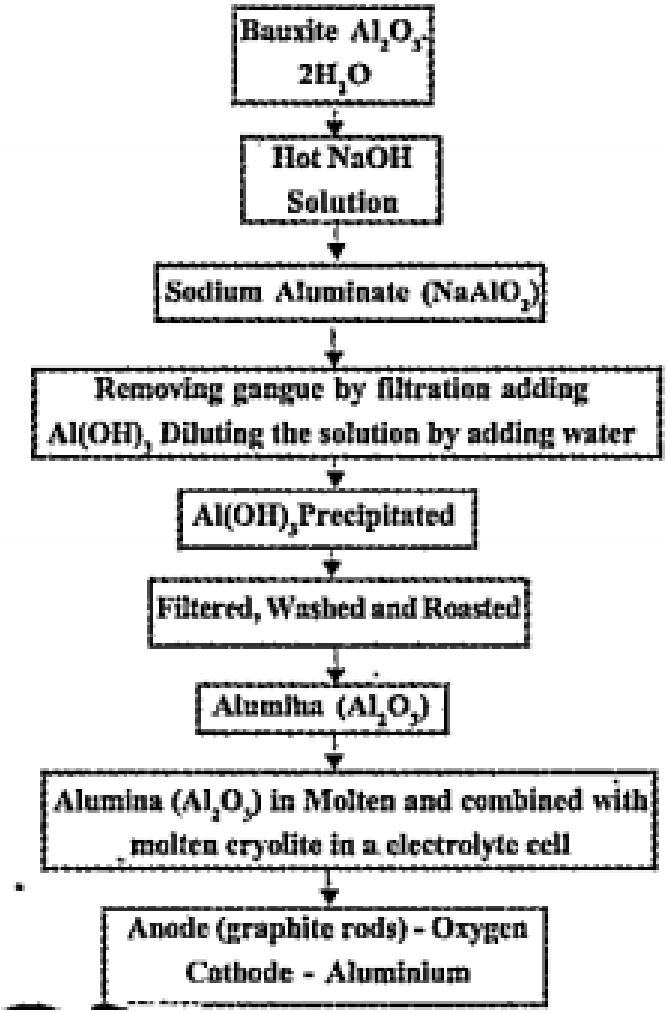
57. Flow chart of Manufacturing Aluminium.



Draw the Electrolytecell and then write answersfor the following questions.Anode is replaced

from time to time while producing aluminium.Why?

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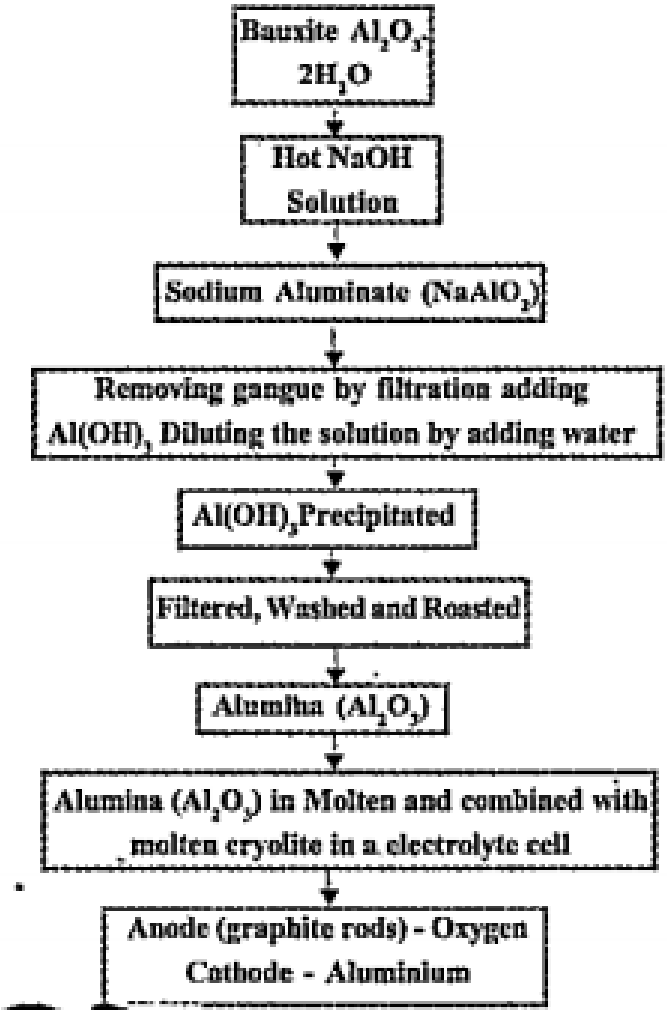
58. Flow chart of Manufacturing Aluminium.



Anode, Cathode in this cell are.....

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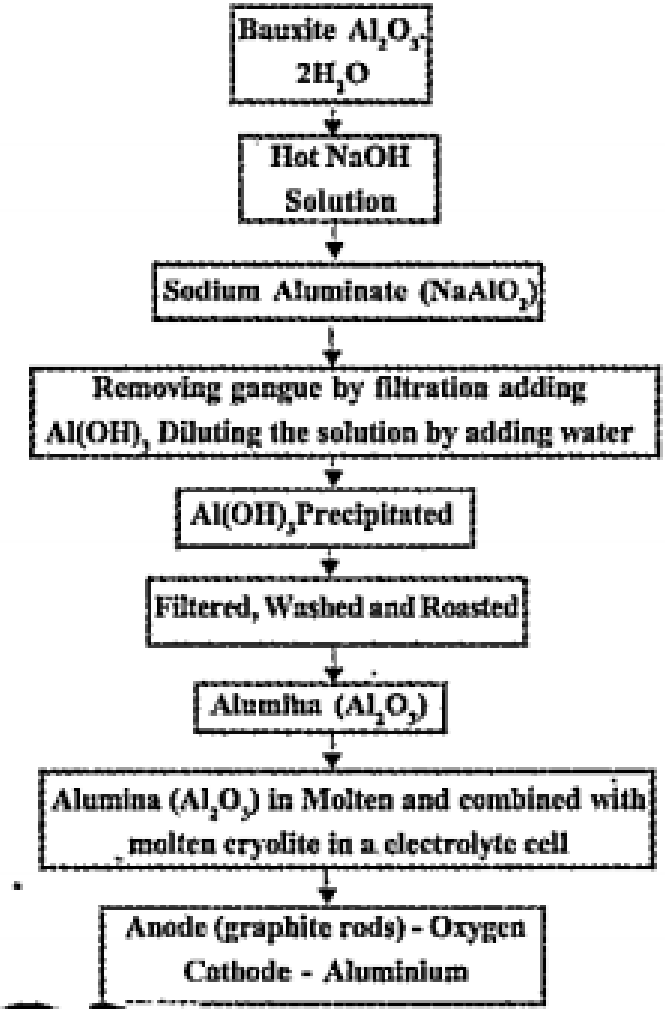
59. Flow chart of Manufacturing Aluminium.



Write

down the reactions taking place in Anode and Cathode.

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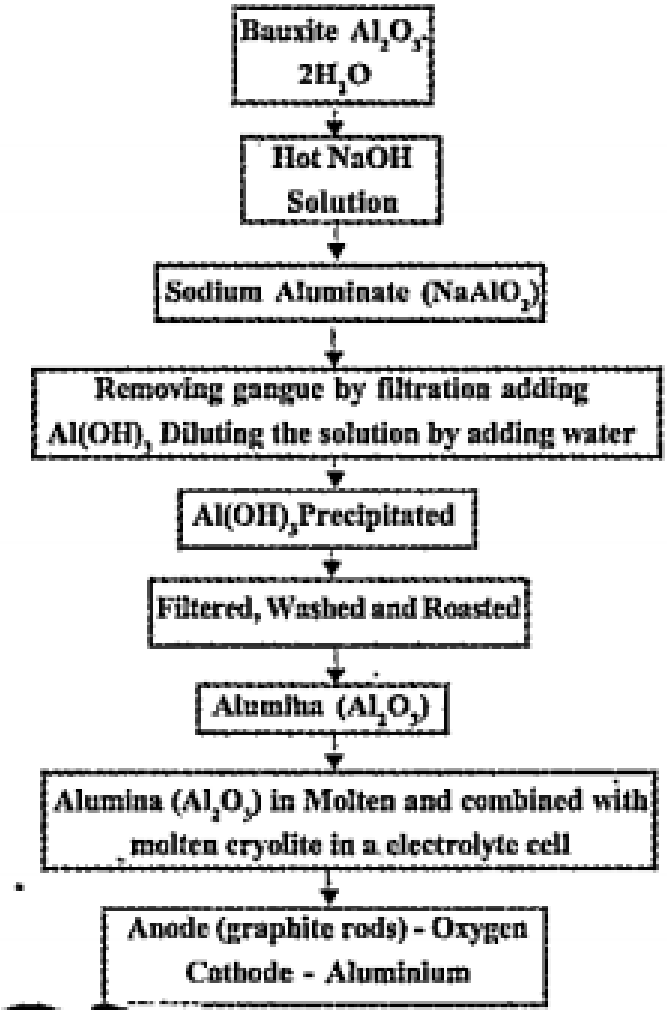
60. Flow chart of Manufacturing Aluminium.



Why Carbon power dropped above the electrolyte?

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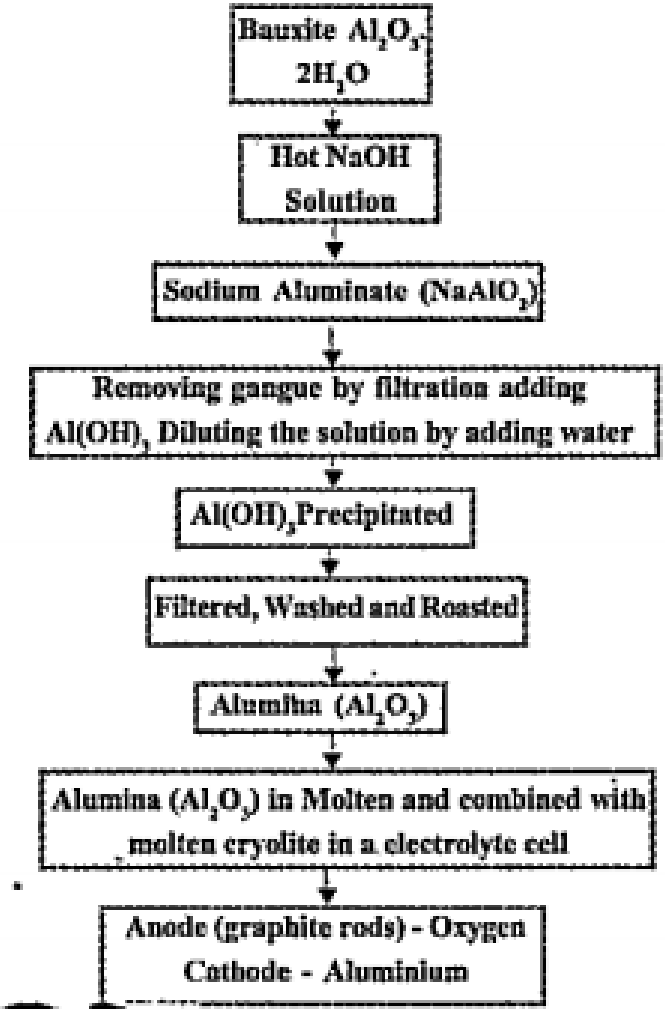
61. Flow chart of Manufacturing Aluminium.



Which gas is evolved out from graphite.

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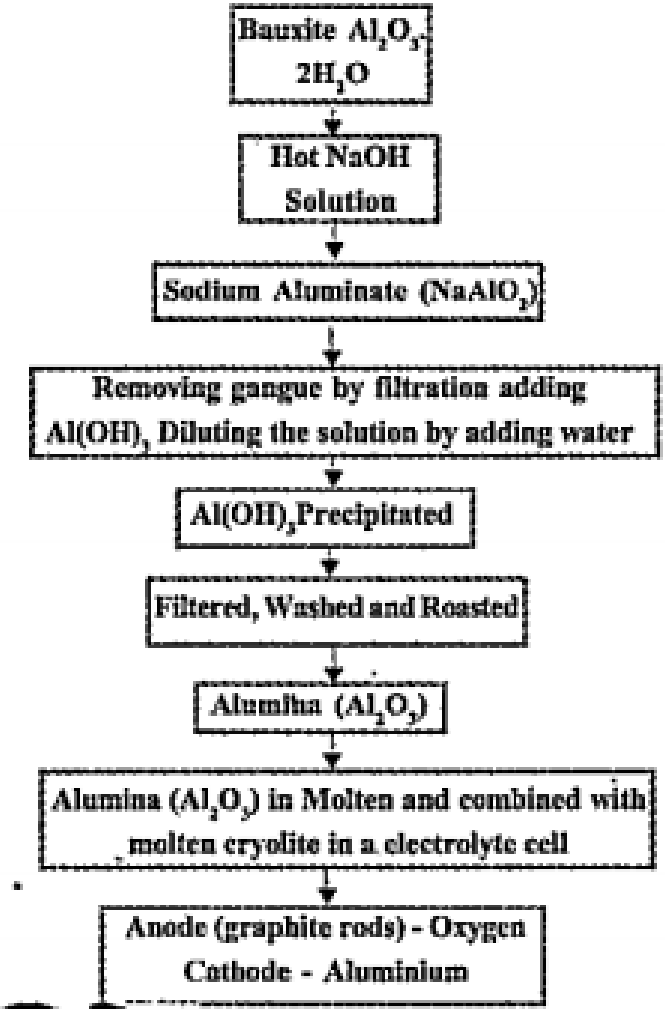
62. Flow chart of Manufacturing Aluminium.



Uses of

Cryolite.

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63. Nature of some ores are given. Pick ore concentrations from the bracket. (Magnetic Separation, Froth Floatation, Levigation, Leaching): Ores are lighter and impurities are heavier.

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64. Nature of some ores are given. Pick ore concentrations from the bracket. (Magnetic Separation, Froth Floatation, Levigation, Leaching): Ore is magnetic. But impurities are non-magnetic.

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65. Nature of some ores are given. Pick ore concentrations from the bracket. (Magnetic Separation, Froth Floatation, Levigation,

Leaching): Uses a solution which dissolves the ore.

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66. Nature of some ores are given. Pick ore con-centrations from the bracket. (Magnetic Separation, Froth Floatation, Levigation, Leaching): Ore is heavier and impurities are lighter.

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67. Some metals and ores are given. Match them suitably.

Metal	Ore
Aluminium	Calamine
Zinc	Bauxite
Iron	Cuprite
Copper	Haematite

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68. Calcination is used to convert zinc carbonate into zinc oxide. But cuprous sulphate is converted into cuprous oxide by

roasting: What is the difference between calcination and roasting?

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69. Calcination isused to convert zinc carbonateinto zinc oxide. But cuproussulphate is converted into cuprousoxide by roasting: What happens to the ore when it is subjected to calcination?

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70. Some metals and their methods of concentration are given. Match them suitably.

Mercury, Zinc, Tin, Copper, Lead
Liquation, Electrolytic refining, Distillation

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71. Write the reason for selecting the methods for concentration of mercury and tin.

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72. The order of reactivity of some metals are given. Answer the following questions by analyzing.it. $Al > Zn > Cu > Au$: Which metals is produced by the electro lysis of its molten salt?

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73. The order there activity of some metalsare given. Answer the following questions by

analyzing.it. $Al > Zn > Cu > Au$: Metal occur in free state in nauture.

Watch Video Solution

74. The order there activity of some metalsare given. Answer the following questions by analyzing.it. $Al > Zn > Cu > Au$: Metal produced by the self oxidation red-uction reaction.

Watch Video Solution

75. The order there activity of some metalsare given. Answer the following questions by analyzing.it. $Al > Zn > Cu > Au$: Metal ore which is reduced by carbon.

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76. A reducing agent is required to extract the metal from its ore. Why? Explain with example.

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77. The equations of the production of iron in the blast furnace are given. Asnwer the following questions

$C + O_2 \rightarrow CO_2,$ $CO_2 + c \rightarrow 2CO,$

$CaCO_3 \rightarrow CaO + CO_2,$

$CaO + SiO_2 \rightarrow CaSiO_3,$

$Fe_2O_3 + 3CO \rightarrow 2Fe + 3CO_2$: Which substance reduces haematite in the metallurgy of iron? How this redu-cing agent is produced in teh furnace?

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78. The equations of the production of iron in the blast furnace are given. Asnwer the following questions

$C + O_2 \rightarrow CO_2,$ $CO_2 + c \rightarrow 2CO,$

$CaCO_3 \rightarrow CaO + CO_2,$

$CaO + SiO_2 \rightarrow CaSiO_3,$

$Fe_2O_3 + 3CO \rightarrow 2Fe + 3CO_2$: Which is the main impurity found in hae-matite? Which substance is used to rem-ove the gangue?

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79. The equations of the production of iron in the blast furnace are given. Asnwer the following questions

$C + O_2 \rightarrow CO_2,$ $CO_2 + c \rightarrow 2CO,$

$CaCO_3 \rightarrow CaO + CO_2,$

$CaO + SiO_2 \rightarrow CaSiO_3,$

$Fe_2O_3 + 3CO \rightarrow 2Fe + 3CO_2$: Write the chemcial equation of the forma-tion of slag in blast furnance.

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80. How pig iron is converted into cast iron?

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81. Molten cast iron is poured into moulds to make different shapes.Which special-ity of cast iron is based for it?

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82. Alloys containing iron are given. Find out a, b, c and d.

Steels	Components	Uses
i. Alnico	.....a.....	.....b.....
ii. .....c.....	Fe, Cr, Ni, C	For making utensils
iii. Nichrome	Fe, Cr, Ni, C	.....d.....

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83. Aluminium is prepared industrially by Hall-Heroult process. Various steps in the concentration of ore are given below. Write them in the correct order.

i)The precipitate formed is separated, washed and strongly heated to get alumina.

ii) Crushed bauxite is leached with hot sodium

hydroxide solution.

iii) Impurities are removed from the sodium aluminate solution by filtration.

iv) Solution is diluted after adding a little aluminium hydroxide, to precipitate aluminium hydroxide .

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84. Aluminium is prepared industrially by Hall-Heroult process. Various steps in the concentration of ore are given below. Write

them in the correct order.

i)The precipitate formed is separated, washed and strongly heated to get alumina.

ii) Crushed bauxite is leached with hot sodium hydroxide solution.

iii) Impurities are removed from the sodium aluminate solution by filtration.

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85. Aluminium is prepared industrially by Hall-Heroult process. Various steps in the concentration of ore are given below. Write them in the correct order.

i)The precipitate formed is separated, washed and strongly heated to get alumina.

ii) Crushed bauxite is leached with hot sodium hydroxide solution.

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86. Aluminium is prepared industrially by Hall-Heroult process. Various steps in the concentration of ore are given below. Write them in the correct order.

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ii) Crushed bauxite is leached with hot sodium hydroxide solution.

iii) Impurities are removed from the sodium aluminate solution by filtration.

iv) Solution is diluted after adding a little aluminium hydroxide, to precipitate aluminium hydroxide .

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87. Carbon monoxide cannot be used as reducing agent to extract aluminium from alumina.Why?

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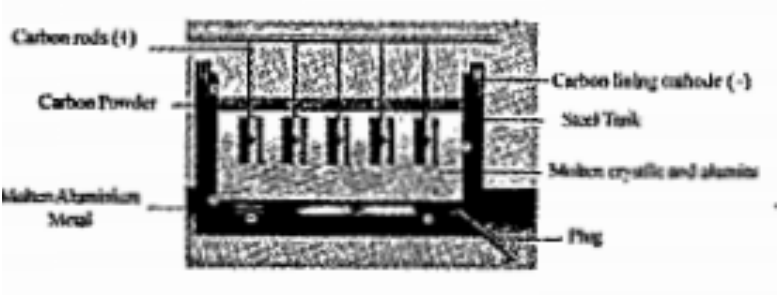
88. The electrolytic cell for alumina is given below.



AI_2O_3 dissolved in molten cryolite is used as the electrolyte. What is the pu-rpose of adding cryolite to alumina?

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89. In electrolysis of alumina. Anode is replaced from time to time while producing aluminium.Why?

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90. Write the chemical equation of the reaction at the cathode. in electrolysis of alumina?

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91. Illustrate the arrangement of refining copper and label the anode,cathode and electrolyte.

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92. Write the general chemical equations at the anode and cathode and show it as a redox reaction.

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93. Clay, cryolite and bauxite are the minerals of aluminium: Which among them is the ore of aluminium? What is its chemical formula?

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94. Clay, cryolite and bauxiteare the minerals of aluminium: What are the features of an ore?

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95. The chemical reaction of calcium carbonate while heating is given. $CaCO_2 \xrightarrow{Heat} CaO + CO_2$ How the reaction is made use in the metall-urgy of iron?

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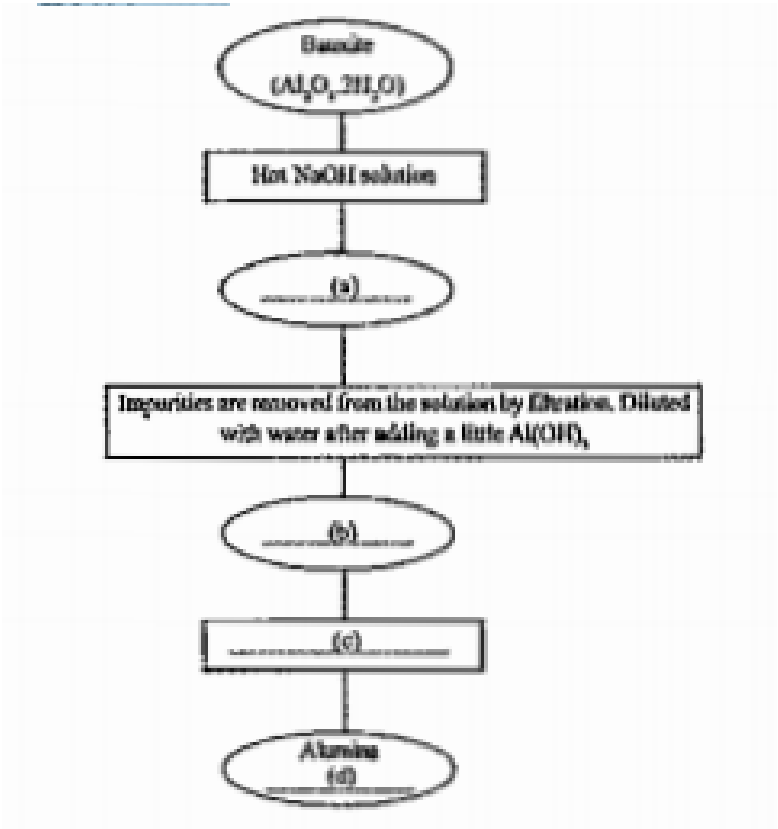
96. The flow chart of the process of concentrate of aluminium ore is given.

Complete the flowchart.



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97. What is the importance of adding cryolite in the electrolysis of alumina?

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98. What are gangue, flux and slag?

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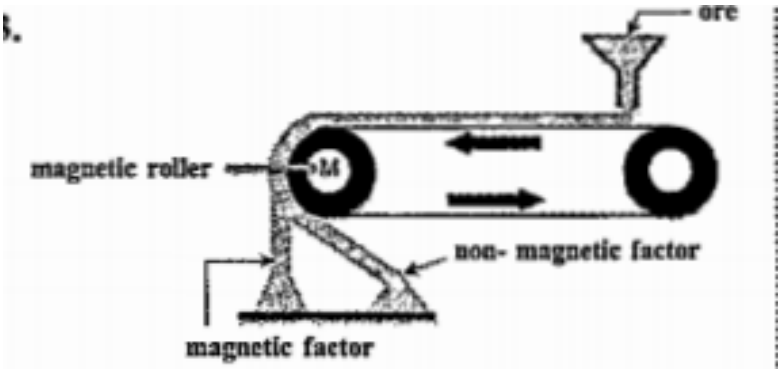
99.



Choose the ore from those given below which can be used in the above figure. Bauxite, Tin stone, Copper pyrites, Calamine.

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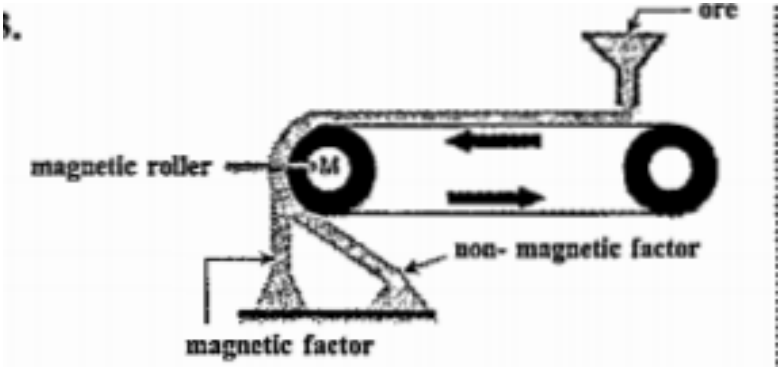
100.



explain the process

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101. Haematite, the ore of iron undergo roasting: Which impurity is not removed by this method?

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102. Haematite, the ore of iron undergo roasting: How is it removed then? Explain.

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103. During the concentration process of bauxite: Why is hot concentrated NaOH used?

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104. During the concentration process of bauxite: Why is $AI(OH)_3$ added in small quantity and diluted with water to sodium aluminate solution?

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105. Define: Cast iron

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106. Define: Wrought iron

Watch Video Solution

107. Match columnsA,Band Csuitably.

A	B	C
Aluminium	Calamine	Cu_2O
Iron	Cuprite	Fe_2O_3
Zinc	Bauxite	$ZnCO_3$
Copper	Haematite	$Al_2O_3.2H_2O$

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108. The concentration methods of certain ores are given below. Why these methods are used: Bauxite-Leaching

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109. The concentration methods of certain ores are given below. Why these methods are used: Magnetite-Magnetic separation

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110. The concentration methods of certain ores are given below. Why these methods are used: Copper pyrites-Froth floatation.

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111. Explain the relationship between reactivitiy series of metals and metallurgy.

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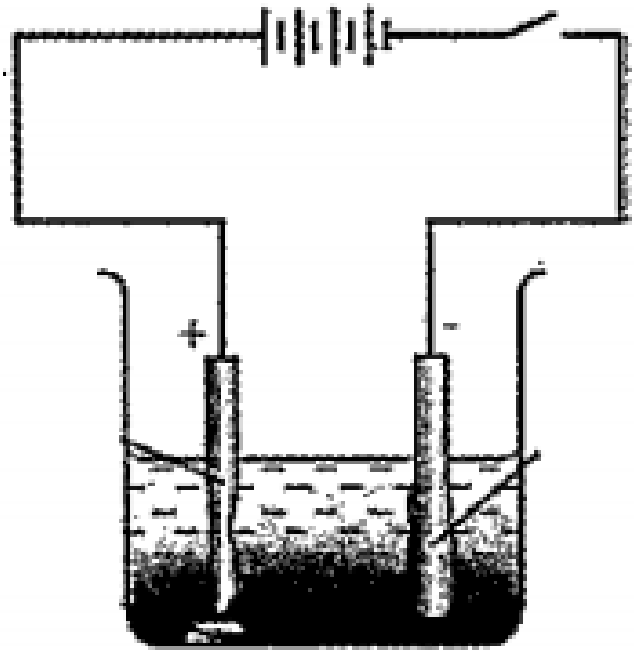
112.



Purification of copper is depicted here: Identify the anode, cathode and electrolyte.

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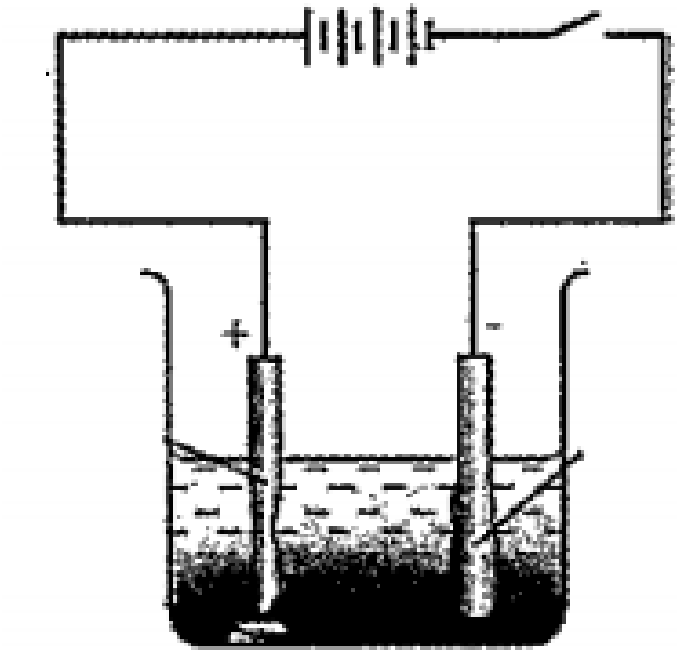
113.



Purification of copper is depicted here: Write the chemical equation during electrolysis.

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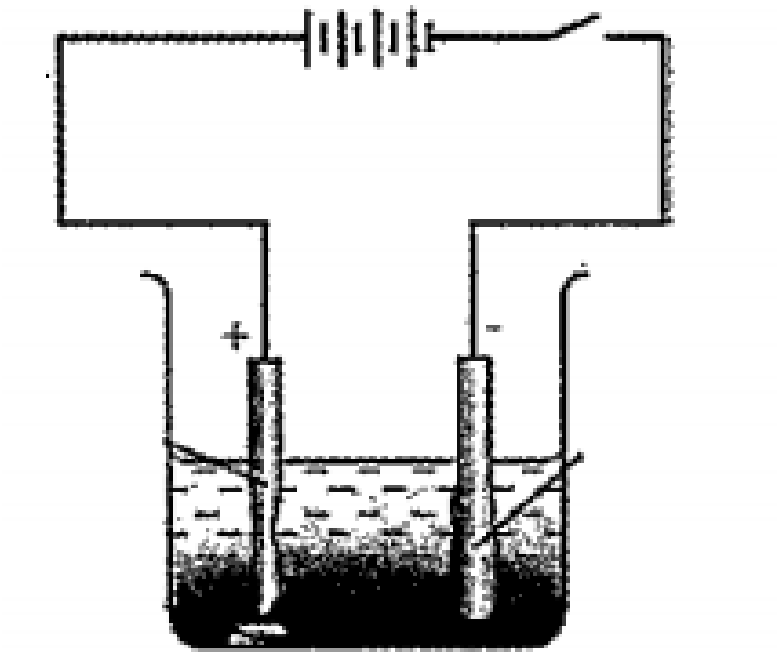
114.



Purification of copper is depicted here: What is seen below the positive electrode?

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115. Certain alloys are given below. Nichrome, Stainless steel: What are the constituent elements in them?

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116. Certain alloys are given below. Nichrome, Stainless steel: What is the reason for the difference in their properties?

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117. Certain alloys are given below. Nichrome, Stainless steel: Write one use of each.

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118. Describe the following: Calcination

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119. Describe the following: Roasting

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120. Complete the table:

Metal	Ore	Chemical formula of ore	Concen-tration method	Uses of conc method
			1. (b)	(d)
Iron	(a)	Fe_2O_3	2. (c)	(e)

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121. Minerals of certain metals are given below.

Write down the refining method of each: Tin

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122. Minerals of certain metals are given below.

Write down the refining method of each: Copper

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123. Minerals of certain metals are given below.

Write down the refining method of each: Zinc

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124. Minerals of certain metals are given below.

Write down the refining method of each: Lead

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125. Minerals of certain metals are given below.

Write down the refining method of each: Cadmium

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126. Minerals of certain metals are given below.

Write down the refining method of each: Silver

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127. Minerals of certain metals are given below.

Write down the refining method of each: Mercury

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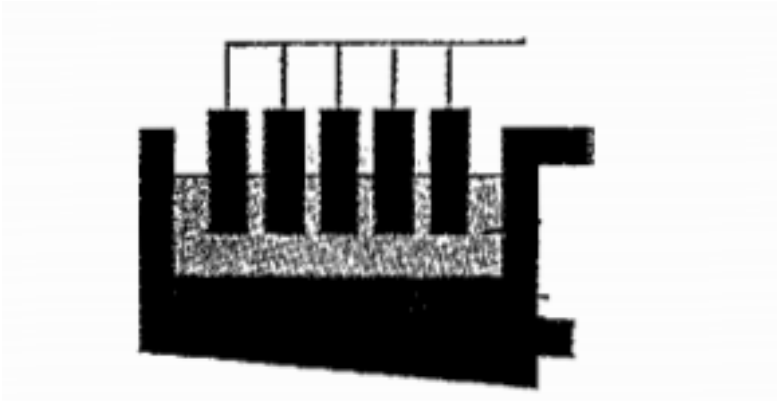
128. The figure depicts the electrolysis of mixture of alumina and cryolite. Label anode, cathode and electrolyte in the figure.



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Exercise

1. Fill in the blanks: Haematite-Iron. Bauxite-.....

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2. Fill in the blanks: Sulphide ores-Froth Floatation. .....-Leaching

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3. Identify the odd one out of the following. Find the reason also, Cryolite, Clay, Calamine, Bauxite.

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4. From those given below choose the metals that can be refined by liquation. Tin, Sodium, Magnesium, Aluminium, Lead.

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5. Match the following:

A	B	C
Calcination	Haematite	Aluminium
Blast Furnace	Bauxite	Iron
Electrolytic method	Sulphide Ore	Calamine
Froath Floatation	Carbonate Ore	Zinc blende

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