CHEMISTRY

NCERT - NCERT CHEMISTRY(ENGLISH)

GENERAL PRINCIPLES AND PROCESSESS OF ISOLATION OF ELEMENTS

Solved Examples

1. (a) Suggest a condition under which magnesium could reduce alumina.

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

(c) What is the reduction of a metal oxide easier if the metal formed is in liquid state at the temperature of reduction ?

(d) At a site, low grade copper ores oare 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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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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Exercise

1. Which of the ores mentioned in Table 6.1 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

$$Cr_2O_3 + 2A < oAl_2O_3 + 2Cr$$

$$\left(\triangle G^{\ominus} = -421kJ \right))$$

Is thermodynamically feasible as is apparent from the Gibbs energy value. Why does it not take place at room temperature?

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4. It is true that under certain condition, Mg can reduce Al_2O_3 and Al can reduce MgO? What are those conditions?

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5. Copper can be extracted by hydrometallurgy but not zinc because

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

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

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8. Explain:

(i). Zone refining

(ii). Column chromatography.

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

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

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11. Write down the reactions taking place in different zones in the blast furnace during the extraction of iron.

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

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

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14. Which method of refining may be more suitable if element is obtained in minute quantity?

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15. Which method of refining will you suggest for an element in which impurities present have chemical properties close to the properties of that elements?

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16. Describe a method for refining nickel.

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

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18. Giving examples differentiate between roasting and calcination.

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19. How is ‘cast iron’ different from ‘pig iron”?

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20. Differentiate between “minerals” and “ores”.

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

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

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

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

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25. The value of $\Delta_f f^{\ominus}$ for formation of Cr_2O_3 is – 540 kJmol–1and that of Al_2O_3 is $-827 kJmol^{-1}$. Is the reduction of Cr_2O_3 possible with Al ?

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26. Out of C and CO, which is better reducing agent for ZnO?

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27. 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 example.

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28. 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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29. What is the role of graphite rod in the electrometallurgy of aluminium?

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30. Outline the principles of refining of metals by the following methods :

(a) Electrolytic refining

(b) Zone refining

(c) Vapour phase refining.

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

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