

10.1 METALS AND METALLURGY

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Characteristics of Metals, Nonmetals, and Metalloids

Minerals and Ores

Alloys and amalgams

- Brass is an alloy of
 - Copper and zinc
 - Copper and nickel
 - Copper and tin
 - copper and lead
- Essential component of an amalgam is
 - Fe
 - Zn
 - Cu
 - Hg

Important mineral deposits in Nepal

- Which of the following minerals does not contain iron?
 - Magnetite
 - magnesite
 - limonite
 - haematite

Types of metallurgical processes

- Pyrometallurgy is not suitable for
 - Ca
 - Zn
 - Hg
 - Fe

General principles of the extraction of metal:

- The waste material in an ore (mineral) is
 - Flux
 - litter
 - gangue
 - slag

1. Crushing and pulverization:

2. Concentration (dressing)

1. Hand picking

- The process of removing lighter gangue particles by washing in a current of water is called
 - Levigation
 - liquation
 - leaching
 - cupellation

2. Froth flotation method

- Oil used in the froth flotation method for the purification of ore is
 - Coconut
 - mustard
 - pine
 - sunflower
- Froth flotation process is used for the concentration of
 - Halide ores
 - oxide ores
 - sulphide ores
 - phosphide ores
- Which ore is generally concentrated by the froth flotation method?
 - Sulphide
 - Oxide
 - Carbonate
 - Nitrate

3. Magnetic separation method

4. Leaching process:

10. Leaching of ores is the process of
a. Concentration b. refining c. reduction d. calcination
11. The process of concentrating ore is called
a) Roasting c) Reduction b) Calcination d) **Beneficiation**
12. If the ore is converted into a soluble form and then separated by filtration, then the process is called
a. Gravity separation b. froth floatation c. Magnetic separation d. leaching

3. Calcination and roasting

Calcination

13. Hydrated alumina is converted into anhydrous form by
a. Calcination b. roasting c. smelting d. leaching
14. Heating of pyrites to remove sulphur is
a. Bessmerization c. Roasting b. Calcination d. smelting
15. Volatile impurities present in the ore are removed in the process
a. Leaching b. calcination c. thermite d. gravity separation
16. Which of the following ores is subjected to roasting?
a. CaCO_3 b. ZnS c. $\text{CuCO}_3 \cdot \text{Cu}(\text{OH})_2$ d. ZnCO_3
17. For which of the following ore calcination is carried out?
a. ZnCO_3 b. Ag_2S c. CuS d. ZnS
18. Which of the following methods is not applied for dressing of ore?
a. Froth floatation b. Calcination c. Gravity separation d. Hand picking
19. The process of heating the ore in the presence of excess air below its melting point is called:
a) Calcination b) Roasting c) Smelting d) Froth floatation
20. Consider the following equation



This operation in metallurgy is called

- a. Calcination b. roasting c. Smelting d. Poling
21. When pyrite ore is heated in the presence of excess air below its melting point, the process is called
a. Calcination b. Roasting c. Smelting d. Thermite process

4. Reduction (Extraction)

22. Substances that react with infusible impurities present in ore to form fusible mass is called
a. Matte b. gangue c. slag d. flux
23. The substance added to remove impurities is called
a. Slag b. flux c. gangue d. catalyst
24. Acidic flux is used for the removal of
a. Basic flux b. basic gangue c. acidic gangue d. slag
25. Acidic flux is
a. CaCO_3 b. CaO c. SiO_2 d. MgO
26. Which of the following is acidic flux?

- a. Borax b. CaO c. MgO d. Dolomite

1. Aluminothermite reduction (Goldschmidt Process)

27. In the aluminothermite process, aluminium acts as
a. Oxidising agent c. reducing agent d. slag d. flux
28. In the Goldschmidt process, the reducing agent is
a. Coke c. carbon d. Al powder b. Na
29. Which of the following metals is extracted by the aluminothermic process?
a. Cr b. Ni c. Al d. Fe

2. Electrolytic reduction

30. The electrolytic reduction method is used in the extraction of
a. Highly electropositive metals
b. Highly electronegative metals
c. Inert metals
d. Transition metals
31. Which of the following metals is extracted by electrometallurgy?
a. Cu b. Na c. Sn d. Fe
32. Volatile impurities present in the metal ores are removed by
a. Leaching b. calcination c. gravity separation d. thermite

5. Purification/refining

33. During electrochemical refining, where is pure metal collected?
a. Cathode b. Anode c. Both pole d. Neither of them
34. In which of the metallurgical processes is metal purified
a. Roasting b. smelting c. electrolysis d. floatation

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