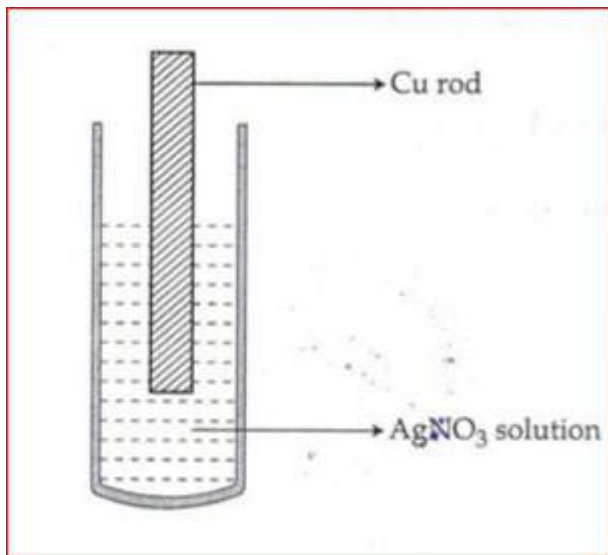


1. Which of the following statements is correct about chemical equilibrium
  - a. At equilibrium both the reactants and products co-exist
  - b. At equilibrium the rate of the forward reaction is greater than the rate of backward reaction.
  
2. Observe the diagram below:



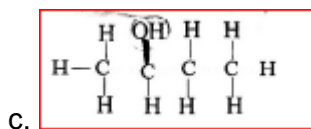
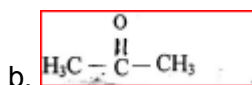
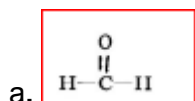
It shows a copper rod kept immersed in a silver nitrate solution. Find out:

- a. What is the colour change of the solution?
  - b. Write the balanced chemical equation for the reaction.
3. (a) Write an example of a metal that can be refined by liquation.  
(b) What is calcination?
4. (a) What are Isomers?  
(b) Write the structural formulae of any two position isomers of an alcohol with molecular formula  $C_5H_{12}O$ .
5. Organic Compounds are obtained through different chemical reactions.
    - a. What is the difference between substitution reaction and addition reactions
    - b. Complete the following reactions:
      - (i)  $CH_3-CH_3 + Cl_2 \rightarrow \underline{\hspace{2cm}} + HCl$
      - (ii)  $CH_3-CH=CH-CH_3 + HI \rightarrow \underline{\hspace{2cm}}$
6. Some bacteria obtain their energy by oxidizing sulphur, producing sulphuric acid as a by-product. In the laboratory and industrially, the first step in the conversion of Sulphur to Sulphuric Acid is to produce Sulphur dioxide. Then Sulphur dioxide is converted to Sulphur trioxide, which reacts with water producing Sulphuric acid.
    - a. Name the industrial method of preparing sulphuric acid
    - b. Name one Catalyst used industrially which speeds up the conversion of Sulphur dioxide to Sulphur trioxide
    - c. Write the equation for the conversion of Sulphur dioxide to Sulphur trioxide
    - d. What is the name of the compound created between Sulphur trioxide and sulphuric acid
    - e. Suggest a method for diluting sulphuric acid

7. State your observations when the following salts are heated. (Equations not needed).

- Lead nitrate
- Calcium carbonate
- Zinc carbonate
- Copper sulphate crystals ( on very strong heating)

8. Write the IUPAC names of the following compounds:



9. Calculate the volume occupied by 0.01 mole of carbon dioxide at S.T.P.

10. Draw the electron dot diagram for the following compounds:

- Methane
- Calcium Chloride

11. An organic compound whose vapour density is 45, has the following percentage composition. H=2.22%, O=71.19% and rest in Carbon. Calculate its (i) empirical value and (ii) molecular formula.

12. Draw the structural formula of the following compounds:

- Butan- 2- OL
- 2,3, dimethyl pentene
- 2-chloro-4-methyl hexane
- Pentyne
- Propanoic acid

13. Arrange the following as per the instruction given in the brackets:

- H e, Ar, N e (increasing number of the order of electron shells)
- Na, Li, K(increasing ionization energy)
- F, Cl, Br (increasing electronegativity)
- Na, K, Li(increasing atomic size)

14. Match the column A with column B and rewrite the correct pairs:

COLUMN A	COLUMN B
1. Sodium Chloride	decreases
(b) Ammonium ion	Covalent bond
(c)Electronegativity in a period	Increases
(d)Carbon tetrachloride	Ionic bond
(e) Atomic radii in a group	Covalent and coordinate bond

**15.** Vapour density of a gas Z is 23. Calculate.

a. Number of moles    b. weight in grams

c. number of molecules, in 6.72 litres of gas as S.T.P

