WORKSHEET 2

CHAPTER 6 – ELECTROLYSIS

A. Tick (✓) the correct option.

1. Which of the following is not a conductor?

   a. Iron b. Silver c. Copper d. Glass

2. Which of the following does not conduct electricity?

   a. Molten potassium bromide b. Sodium hydroxide dissolved in water

   c. Solid sodium chloride d. Molten zinc nitrate

3. Which of the following is not a non-electrolyte?

   a. Pure water b. Alcohol c. Kerosene d. None of these

4. Who demonstrated that that electrolytes conduct electricity because of the presence of ions?

   a. Nicholson b. Arrhenius c. Newland d. None of these

5. Which one of the following loses electrons with difficulty?

   a. Calcium b. Sodium c. Silver d. Zinc

B. Fill in the blanks from the choices given within the brackets.

1. As we descend the electrochemical series containing cations, the tendency of the cations to get _____ (oxidized/reduced) at the cathode increases.
2. The _____ (higher/lower) the concentration of an ion in a solution, the greater is the probability of its being discharged at its appropriate electrode.
3. Pure water consists almost entirely of _____ (ions/molecules)
4. We can expect that pure water _____ (will/will not) normally conduct electricity.
5. With platinum electrodes, hydrogen is liberated at the _____ (cathode/anode) and oxygen at the _____ (anode/cathode) during the electrolysis of acidified water.

C. A metal article is to be electroplated with silver. The electrolyte selected is sodium argentocyanide.

1. What kind of salt is sodium argentocyanide?
2. Why is it preferred to use silver nitrate as an electrolyte?
3. State one condition to ensure that the deposit is smooth, firm and long lasting.
4. Write the reaction taking place at the cathode.
5. Write the reaction taking place at the anode.

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D. Mr Sharma wants to electroplate his key chain with nickel to prevent rusting. For this electroplating

1. Name the electrolyte.
2. Name the cathode.
3. Name the anode.
4. Give the reaction at the anode.
5. Give the reaction at the cathode.

E. Answer the following.

1. Three different electrolytic cells A, B and C are connected in simple circuits. Electrolytic cell A contains sodium chloride solution. When the circuit is completed, a bulb in the circuit glows brightly. Electrolytic cell B contains acetic acid solution and in this case the bulb glows dimly. The electrolytic cell C contains sugar solution and the bulb does not glow. Give a reason for each observation.
2. Why is carbon tetrachloride, which is a liquid, a non-electrolyte?
3. A solution of silver nitrate is a good electrolyte but it is not used for electroplating an article with silver. Give reason.
4. A strip of copper is placed in four different colourless salt solutions. They are KNO_3, $AgNO_3$, $Zn(NO_3)_2$, $Ca(NO_3)_2$. Which one of the solutions will finally turn blue?
5. Write the equations of the reactions which take place at the cathode and anode when acidified water is electrolysed.

ANSWERS

WORKSHEET 2

A. Tick (✓) the correct option.

1. d
2. c
3. d
4. b
5. c

B. Fill in the blanks from the choices given within the brackets.

1. reduced
2. higher
3. molecules
4. will not
5. cathode, anode

C. A metal article is to be electroplated with silver. The electrolyte selected is sodium argentocyanide.

1. A complex salt.
2. As it gives a smooth and firm silver plating over article.
3. When a low voltage current is passed for long duration of time.
4. At cathode: $Ag^+ + e^- \rightarrow Ag$
5. At anode: $Ag - e^- \rightarrow Ag^+$

D. Mr Sharma wants to electroplate his key chain with nickel to prevent rusting. For this electroplating.

1. Nickel sulphate
2. Key chain
3. Pure nickel plate
4. $Ni - 2e^- \rightarrow Ni^{2+}$
5. $Ni^{2+} + 2e^- \rightarrow Ni$

E. Answer the following.

1. In cell A: Sodium chloride (A strong electrolyte) completely dissociates and thus current flows better.

   In cell B: Acetic acid (A weak electrolyte) partially ionizes and thus, a weak current flows.

   In cell C: Sugar (A covalent compound) does not ionize and thus no current flows.

2. Carbon tetrachloride is a covalent compound. It does not have ions.

3. It is because it does not give uniform coating of silver.

4. $AgNO_3$

5. $H_2O \rightarrow H^+ + OH^-$

   $H_2SO_4 \rightarrow 2H^+ + SO_4^{2-}$

   at anode $OH^- \rightarrow OH + e^-$

   $4OH \rightarrow 2H_2O + O_2\uparrow$

   at cathode $H^+ + e^- \rightarrow H$

   $H + H \rightarrow H_2$