

EXPERIMENT 4: ELECTROLYSIS OF WATER

Equipment: Hoffman Apparatus, test tubes, wood splints, DC power pack.

In this experiment you will study a chemical change brought about by an electric current.

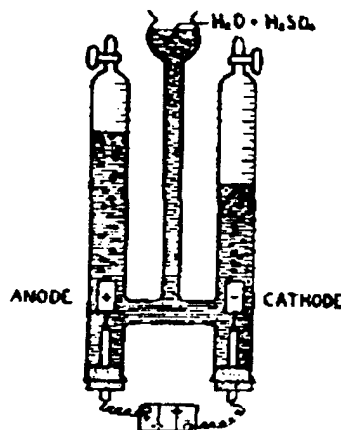
- A. Set up the "Hoffman" apparatus as shown in the diagram. Connect to a source of direct current (DC).

1. What do you see happening at the electrodes?

- B. Allow the current to run for about 5 minutes. Measure the volumes of gas collected above each electrode for another 5 minutes and take another reading.

- C. Collect the gas above the negative electrode in a test tube by the downward displacement of air. Bring the mouth of the test tube to a Bunsen flame.

Time	Anode	Cathode
0		
5 min.		
10 min.		



3. What happens? _____

4. What gas is this? _____

- D. Hold a glowing splint above the positive electrode stopcock and open it slowly.

5. What happens? _____

6. What gas is this? _____

- E. If time permits, empty the tubes of the apparatus of all remaining gases, reverse the electrodes and repeat the experiment.

7. At which electrode does the hydrogen gas collect? _____

8. At which electrode does the oxygen gas collect? _____

9. Compare these volumes with the previous volumes obtained? _____

- F. Turn off the power supply.

10. What happens? _____

11. Is the electrolysis of water an exothermic or endothermic reaction? Why? _____

SUMMARY QUESTIONS

1. Define electrolysis. _____

2. Draw a fully labelled potential energy diagram for the electrolysis of water.

3. What does the electrical energy do? _____

4. If energy cannot be destroyed, where is the electrical energy? _____
In what form is it? _____

5. Write a balanced equation for the decomposition of water by electricity.

6. How does the balanced equation relate to the volumes of gas produced? _____

7. Why does the water in the electrolysis apparatus contain a small amount of Na_2SO_4 ? _____