

Introduction to Electrochemistry

Data Table

Initial Indicator Color of the Electrolysis Solution	
Changes Occurring at the Positive (+) Electrode	
Changes Occurring at the Negative (–) Electrode	
Final Indicator Color of the Mixed Electrolysis Solution	

Post-Lab Questions *(Use a separate sheet of paper to answer the following questions.)*

- Suggest an explanation for the initial indicator color of the electrolysis solution.
- Describe at least three observations that indicate a chemical reaction has occurred during the electrolysis of water.
- What are the two functions of the pencil lead electrodes?
- Compare the color changes observed at the positive (+) and negative (–) electrodes. What ions were produced at each electrode?
 - Write out the oxidation and reduction half-reactions for the decomposition of water and identify which reaction occurred at each electrode, based on the indicator color changes.
- Compare the rates of gas evolution at the positive (+) and negative (–) electrodes. What gas was produced at each electrode? Explain, based on the balanced chemical equation for the decomposition of water. (See *Pre-Lab Question #1*.)
- Suggest an explanation for the *final* indicator color of the mixed electrolysis solution (step 9 in the Procedure).
- Think about the flow of electrons and current in the electrolysis of water. What do the positive and negative signs on a battery signify?
- (Optional)* Decomposing water to its elements requires energy in the form of electricity. The reverse process, combining hydrogen and oxygen to form water, may be used to generate electricity in a fuel cell. Research and describe the basic features of a fuel cell.