

Lab: Building an Electrochemical Cell

Name:

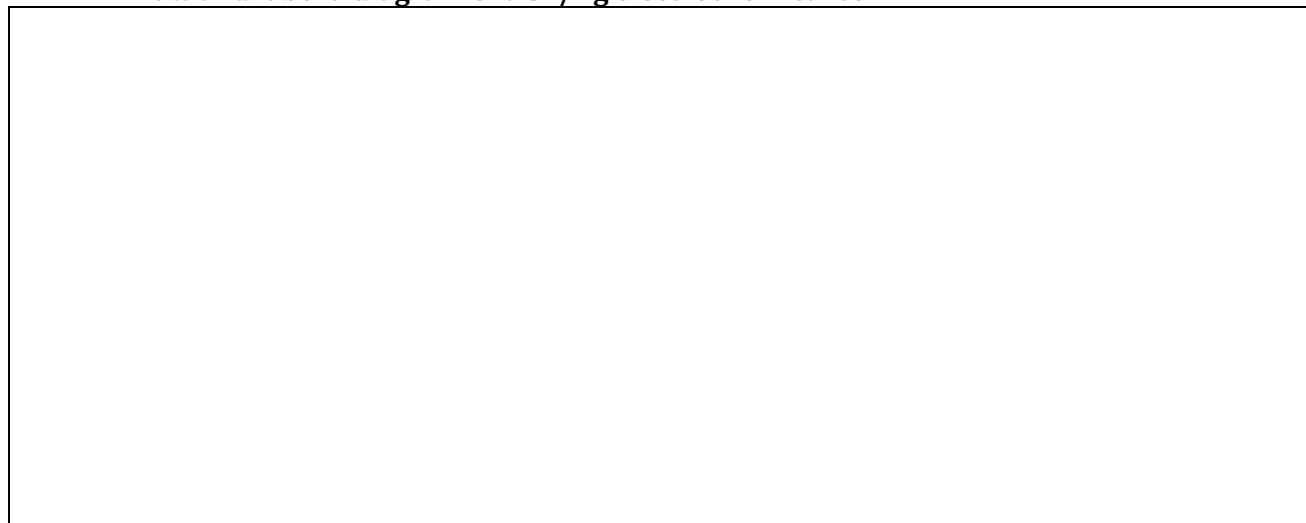
Block:

For Students:	For Teacher:
Lab performed:	Pre-lab completion: <input type="checkbox"/> Yes <input type="checkbox"/> No
Lab due:	Lab Submitted: <input type="checkbox"/> On Time <input type="checkbox"/> Late

Introduction:

Electrochemical cells are extensively used in our society. They come in many shapes and sizes and have many applications. Although the types of electrochemical cells are varied, the operation of all types is based on the same principle – spontaneous redox reactions. The chemistry involved is the same as that for a redox reaction between species in the same container. However, an electrochemical cell is set up so that the reacting species are not permitted to come in contact with each other. Electrons are transferred from one species to another by means of an external circuit. In this external circuit, the energy of the electrons is “tapped” or put to work, to illuminate a light bulb, for instance.

✓ **Draw and label a diagram of a Sn/Ag electrochemical cell:**

**Procedure:**

✓ The metals available are:

✓ The solutions available are:

Choose 4 metal combinations and their respective aqueous solutions and measure the voltage produced.

Cell #1:

⇒ Anode:

⇒ Half-reaction at anode:

⇒ Cathode:

⇒ Half-reaction at cathode:

⇒ Overall Reaction:

⇒ Voltage produced:

Cell #2:

⇒ Anode:

⇒ Half-reaction at anode:

⇒ Cathode:

⇒ Half-reaction at cathode:

⇒ Overall Reaction:

⇒ Voltage produced:

Cell #3:

⇒ Anode:

⇒ Half-reaction at anode:

⇒ Cathode:

⇒ Half-reaction at cathode:

⇒ Overall Reaction:

⇒ Voltage produced:

Cell #4:

⇒ Anode:

⇒ Half-reaction at anode:

⇒ Cathode:

⇒ Half-reaction at cathode:

⇒ Overall Reaction:

⇒ Voltage produced:

Analysis of Results:

1. Rank the cells in order of least to greatest voltage produced:

2. What are the various half-cell reactions?

3. From your SRP table in your data booklet, calculate the expected voltage and compare it to the actual produced voltage:

a. Cell #1

Expected voltage:

Actual voltage:

b. Cell #2

Expected voltage:

Actual voltage:

c. Cell #3

Expected voltage:

Actual voltage:

d. Cell #4

Expected voltage:

Actual voltage:

4. What is the strongest OA?

5. What is the strongest RA?

6. From the information in #4 and #5, draw and label an electrochemical cell: