

AP WORKSHEET 09GHIJ: Electrochemistry Simulations

Go to this website: <http://web.mst.edu/~gbert/Electro/Electrochem.html>

Carry out the following operations IN THE EXACT ORDER below (doing this in the wrong order may cause the simulation to make NO sense).

NOTE:

1. To calculate the cell voltages in these problems, use the standard electrode potentials that pop-up in the window that opens when you click “standard potentials” in the top left hand corner of the web page, and NOT the standard electrode potentials in your notes.
2. In galvanic cells, the cathode (where reduction takes place), is the positive electrode.

Level 0

1. On the Left, choose magnesium and magnesium nitrate as the electrode and solution respectively, and then choose copper and copper (II) nitrate on the right. Leave the concentrations of both cells as 1.00M, and ensure that you are on a “Level 0” problem.
2. BEFORE clicking on “Measure Cell Voltage”, make a prediction about the voltage that the cell will generate if it is set up as a working, galvanic cell.
3. Click “Measure Cell Voltage” to check your prediction.
4. Repeat the procedure above, each time trying different combinations of cells and solutions until you find a pair that gives a **NEGATIVE** voltage on the meter. When you have found such a pair, answer the questions that follow;
 - (i) Which half-cell is connected to the positive terminal of the meter?
 - (ii) Which half-cell is connected to the negative terminal of the meter?
 - (iii) What does the negative voltage tell you?

Level 1

5. Refresh the webpage and choose "Level 1". The electrodes, solutions and concentrations will be selected for you. Calculate the voltage based upon the cell given. Click "Check Answer" to see if you were correct.
6. Repeat the procedure in #5 until you have correctly predicted the voltage for five, different cells.

Level 2

7. Refresh the webpage and choose "Level 2". This time you are asked to find the Standard Electrode potential for the fictitious metal Whodatium and its ions. Choose electrodes, solutions and concentrations for each half-cell, click on "Measure Cell Voltage" and use the voltage to calculate the Standard Reduction potential for the Whodatium half-cell. Click "Check Answer" to see if you were correct. Repeat this procedure for three, different values of the Whodatium half-cell.

Level 3

8. Refresh the webpage and choose "Level 3". Follow the instructions in order to construct the cell with the voltage given, by choosing appropriate electrodes, solutions and concentrations for each of the half-cells. Click on "Check Answer" to see if you were correct. **NOTE: The anode is the electrode where oxidation takes place.** Repeat this procedure for three, different cells.