

CHEG 3128 – Chemical Engineering Junior Laboratory Spring 2017 – Battery 1 Prelab

In this lab, we are going to draw from previous experience in Chemistry, Physics, and Thermodynamics classes and build from your base in Kinetics this semester in CHEG 3151 to look at a new class of systems: electrochemical devices. In the end, you will design a fully functional battery pack system that is capable of powering a (toy) car. But, we will work together in stages to build your knowledge and confidence to accomplish this. In this laboratory session, we will start to explore the thermodynamic factors that influence battery behavior through:

1. In class lecture and discussion; and
2. Demonstration of simple electrochemical cells

After this laboratory, you will be asked to not only recreate, but to extend the concepts from class and explain the behavior that you see. In order to be prepared for the lecture and discussion, there are a few things that you should do before arriving in class.

1. Read: <https://www.khanacademy.org/science/chemistry/oxidation-reduction/redox-oxidation-reduction/a/oxidation-reduction-redox-reactions>
2. Watch the following video: <https://www.khanacademy.org/science/chemistry/oxidation-reduction/redox-oxidation-reduction/v/oxidizing-and-reducing-agents-1>
3. Watch the following video: <https://www.khanacademy.org/science/chemistry/oxidation-reduction/redox-oxidation-reduction/v/redox-reaction-with-iron>

There will be a laboratory assignment posted to Husky CT that provides detail regarding the tasks that will need to be completed before the group's assigned time for the second part of this lab (shown as Battery 2 in the Laboratory Schedule).

You will also need to procure all of the supplies for the lab yourself, including “equipment” the resistor box and a multimeter.

You can find a reasonably inexpensive resistor box here: https://www.amazon.com/Elenco-RS-500-Resistance-Substitution-Box/dp/B0002KX76M/ref=sr_1_1?ie=UTF8&qid=1483732080&sr=8-1&keywords=resistor+box.

An example of an inexpensive multimeter is: https://www.amazon.com/INNOVA-3320-Auto-Ranging-Digital-Multimeter/dp/B000EYVGZA/ref=sr_1_3?ie=UTF8&qid=1483731985&sr=8-3&keywords=multimeter.

Also, groups are allowed to borrow or share “equipment”, but are not allowed to share consumables or other general supplies in order to reduce overlap between groups.