

Electrochemistry Unit Overview

Day 1

✓ Electrolysis of Water Demonstration

The purpose of this is to show students how energy can be exploited to do something useful. In this case the word useful denotes generation of oxygen and hydrogen. A few brief comments will be made how some reactions will generate energy in the form of electricity. This reaction is not one of those. Energy (in the form of electricity) must be supplied to it for the hydrolysis to occur at all. This demo also will help to get students interested in the new topic.

✓ Introduction to Redox Reactions

Students will be introduced to the idea of transfer of electrons. When I say introduce I mean, introduce. I simply want them to hear the terms so when they see them in the future (like the following day) they won't be completely lost. The class will have a discussion about electron transfer and the terms oxidation and reduction.

✓ Corrosion Set-Up

This is a mini lab that will be started at the end of the unit and then completed at a later (see schedule) date. The students will be given a number of iron nails and they will be instructed in the different ways of treating them. (i.e. wrapping one end with zinc, a different nail's end with copper wire, etc.) They will then be asked to make predictions about what will happen to the nails in the ensuing time, and why they think these things will happen. This will take place in a class discussion. They will need to record their predictions. I am particularly interested in getting their ideas about rusting. I want them to discover a common misconception about rust (that it will decrease the mass of a substance) is not true.

Day 2

✓ Redox (Part II)

Lecture mainly about terminology: oxidation, reduction, electron transfer, and oxidation number. Also reducing agent and oxidizing agent will be covered. At this point, the student should already be familiar with how to determine oxidation numbers for elements in a compound, as well as element by themselves. A short refresher might be necessary by working a few examples on the board. They will be given examples where they will be required to find the change in oxidation state of the elements involved and then to determine what is being oxidized and reduced along with identifying the oxidizing the reducing agents. They will have a brief homework assignment consisting of problems similar to the examples we worked in class.

Day 3

✓ Introduction to Electrochemistry

Students will be introduced to electrochemical cells and how this relates to redox reactions. The concept of a half reaction will be introduced. The idea that a reaction can produce energy will be discussed, but that if a redox reaction is to be used as source of energy the two half reactions must be separated. A sample half reaction will be set up in