Quiz 6
CHEM 311 Fall 2004

A 50.00 ml aliquot of a 0.010 M solution of $Cu(NO_3)_2$ is added to 100.00 ml of a 0.10 M $Zn(NO_3)_2$ solution. Small pieces of zinc metal and copper metal are added and continuously stirred. Does a reaction occur? If so, what are the products of the reaction and why? What would you expect to observe as the reaction proceeded?

$Cu^{2+} + 2e^- \leftrightarrow Cu(s)$ $\quad E^0 = 0.339$ V

$Zn^{2+} + 2e^- \leftrightarrow Zn(s)$ $\quad E^0 = -0.762$ V

Cu^{2+} is a much stronger reductant than Zn^{2+}. Therefore the following reaction has a very large equilibrium constant.

$Cu^{2+} + Zn(s) \rightarrow Cu(s) + Zn^{2+}$

The reaction essentially goes until all of the Cu^{2+} has reacted.

The products are Cu(s) and Zn^{2+}. The reaction occurs on the surface of the pieces of zinc. A coating of copper forms on the surface of the zinc.