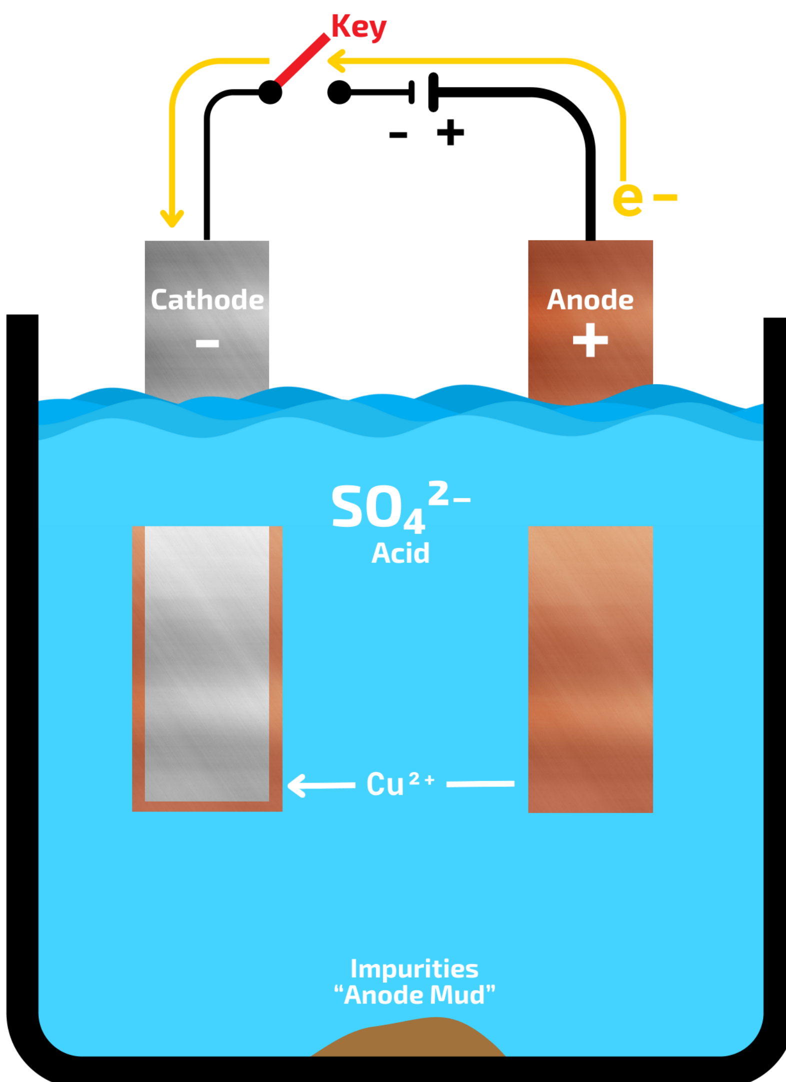
Electroplating *Copper*

Electroplating is a process where one metal is plated using a hydrolysis process, from solution onto the cathode. In this example, we'll use Copper—Cu—to illustrate.

The manufacturing panel in this process is the cathode (negative terminal) with copper metal as the anode (positive terminal). The solution from which the copper is plated is Copper Sulfate—$CuSO_4$—which ionizes in solution to Cu^{2+} and SO_4^{2-} When a current is ran through the plating cell the positive copper ions are attracted to the cathode (negative terminal) and reduced from Cu^{2+} to Cu metal and H_2 gas. Conversely, as the Cu ions in solution are plated onto the cathode copper from the anodes are dissolved into the solution to replace.

There are several factors that can influence this electroplating process: panel / board design, voltage / amperage, temperature, time, chemical composition and cell construction. Manufacturers need to have control of all of these factors in order to create a repeatable process to achieve the proper copper deposition thickness, physical copper characteristics and proper deposit distribution.



Cathode = Manufacturing Panel
Anode = Copper (Cu)