Wiyawit Anantchanchai 2006: Electrochemical Treatment Process for the Recovery of Copper from Activated Carbon Adsorbed Copper in Wastewater. Master of Engineering (Environmental Engineering), Major Field: Environmental Engineering, Department of Environmental Engineering. Thesis Advisor: Mr.Mongkol Damrongsri, Dr.Ing. 96 pages.
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Copper is a critical component of modern industry including electroplating, electrical wiring, electronic equipment, jewelry, etc. Copper is mostly found in Cu^{+} and Cu^{2+} form, which are dangerous to aquatic animals if they are concentrated.

Electrochemical process is a good alternative for removal of copper. An electric current reduces and separates copper from wastewater. We also can recycle copper. This research is using an electrochemical process combined with activated carbon absorption to increase copper concentration and save electric usage. Activated carbon is used to absorb wastewater with Cu^{2+} for anode and Fe for cathode. This research is focus on the effects of water purification from copper, which are initiating pH, electrolyte concentration, voltage and time. It is concluded that the efficiency of purification process varies with electrolyte concentration and time. The appropriate condition is pH 1.2 and 2 Volts. This condition can separate 8.356 mg/g. of activated carbon. Copper residue will be 1.000 mg/g. of activated carbon and totally separate from activated carbon:

$$Cu_r = \frac{0.4795t}{0.35+t}$$

where Cu_r = seperated copper from anode (g.)

t = time of electrochemical process (hour)

The electrochemical processed activated carbon has reduced iodine number to 86.83% but copper adsorption efficiency of activated carbon is very low.

Student's signature Thesis Advisor's signature 19 / May / 2006