

143f Treatment of Waste Streams Containing Organic Compounds and Copper (II) Using Chelators

Worawan Kay Maketon and Kimberly Ogden

In the semiconductor industry, copper metal is being used instead of aluminum. The major benefit of copper is that copper transmits electrical signals faster than aluminum in thinner, narrower wires necessary for the ever-shrinking universe of semiconductors. The copper chemical mechanical planarization process (Cu-CMP) is the critical step that is repeated several times during the production of a single wafer. The incorporation of copper in integrated circuit metallization had resulted Cu-CMP and post-CMP cleaning waste streams that contain copper nitrate, silica particles, surfactants and some organics. This study explores the use of polyethyleneimine (PEI) bound with crosslinked and activated agarose gel, Novarose™, for waste treatment of a model Cu-CMP wastewater, containing copper (II) solution and IPA. Both batch and continuous flow column experiments were performed. The results showed that PEI-agarose was efficient at binding copper from CMP wastes. PEI-agarose adsorbent can be regenerated, allowing for copper recovery from the wastewater. Moreover, the adsorbent stability is good. It can be regenerated numerous times.