



Technology Summary: Cupric Chloride Etchant Copper Recovery System

Opportunity Statement

Copper etching is an important process in the fabrication of printed circuit boards. The etchants commonly used in the industry today are cupric chloride, ferric chloride and alkaline etchants. Cupric chloride is rapidly becoming the etchant of choice because of its stable characteristics and lower cost of processing. More importantly, it is more cost effective to regenerate than the other etchants.

With the price of copper realizing substantial increases over the past few years, the economic advantage of recovering copper from cupric chloride etchant has correspondingly increased.

Problem

Conventional cupric chloride copper recovery systems can be classified into four areas of technology: Direct Electrodeposition; Cementation; Copper Oxide Precipitation; and Solvent Extraction. However, each of the four technologies has some shortcomings as described below.

Direct Electrodeposition

- High operation cost as it requires large voltages for operation
- Quality of extracted copper is poor due to impurities in the waste etchant

Cementation

- Metal chlorides other than copper are formed as by-products

Copper Oxide Precipitation

- High cost due to the use of caustic solution
- Collection of fine copper oxides from saline solution is difficult

Solvent Extraction

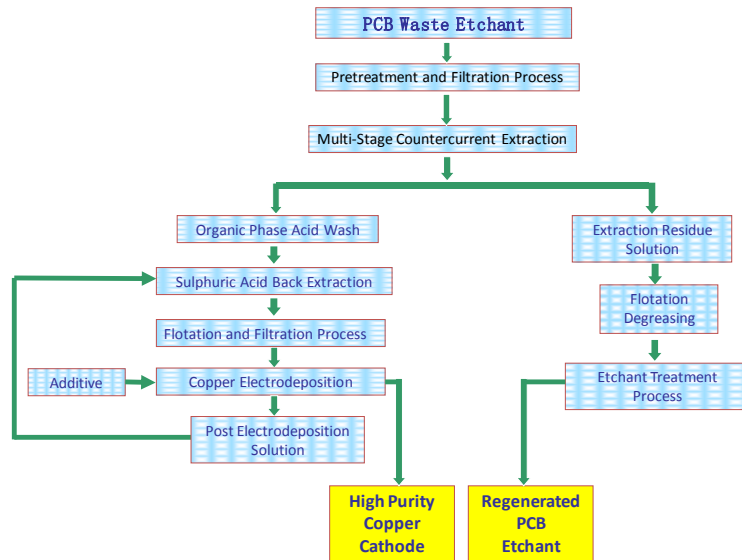
- High-purity copper is difficult to obtain

Therefore, there is a need for a technological solution which addresses the limitations of current waste etchant treatment and copper recovery processes.

Technology Summary: Waste Etchant Copper Recovery System

360ip Partner's Solution

The technology developed by 360ip's Partner provides an improved solvent extraction method as shown in the diagram below. This invention is able to provide high-purity copper at a high recovery rate through the use of a novel multi-stage extraction process.



Compared to conventional recovery technologies, the 360ip Partner's technology provides the following advantages:

- High purity (over 99.99%) of recovered copper
- High copper recovery rate (over 95%)
- Better crystalline structure of the recovered metal, resulting in improved electrical conductivity
- Extraction realized under high copper concentration
- Low operational cost

Patents

360ip's Partner has two pending patents on this novel recovery technology.

360ip is seeking interested parties for the licensing, further development and commercialization of this technology-based product.

For additional information, contact:

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