VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELGAUM

PROJECT REPORT ON

RECOVERY OF COPPER FROM ELECTROPLATING SLUDGE USING CEMENTATION METHOD

(Project Sponsored By K S C S T)

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SYNOPSIS

Before end-of-pipe wastewater treatment or modifications to existing wastewater treatment facilities, a program of waste minimization should be initiated. Reduction and recycling of waste are inevitably site-and plant-specific, but a number of generic approaches and techniques have been used successfully across the country to reduce many kinds of industrial wastes. Generally, waste minimization can be achieved through recycling and reuse. This technique can have application across a range of industries and manufacturing processes, and can apply to both hazardous and nonhazardous wastes.

The heavy metals used in industrial processes include Cu, Zn, Pb, and its alloys. As some of these heavy metals are costlier it needs to be recovered for re-use enabling in reduction of environmental impact.

In the present study, an attempt is being made to recover copper from Electroplating industrial sludge using cementation process.

In this metallurgical coating process, steel rods are dipped in a cyanide-free slurry containing electroplating sludge, diluted Hydrochloric acid with distilled water in varied proportions with continuous stirring of slurry using a mechanical Stirrer at a speed of 30 rpm around the rigidly fixed steel rods results in copper recovery through cementation method.

The initial concentration of copper in electroplating sludge was found to be 57.78mg/kg. Cementation process was carried out with different dilutions of Water to Hcl ratio of 1:5 to 1:25. Copper recovered for 1:5, 1:10, 1:15, 1:20, and 1:25 ratio for three hours duration of stirring was found to be 68%, 75%, 77%, 61%, 70% respectively. The maximum amount of copper recovery was found to be 77% for water to Hcl ratio of 1:15 (1 part of water and 15 part of Hcl) for 3 hours of stirring at a room temperature of 27°C.

Based on the research work carried out, it can be concluded that the main objective of Recovering Copper from electroplating sludge containing multi-heavy metals is achieved..