

VISVESVARAYA TECHNOLOGICAL UNIVERSITY

BELGAUM-590 018



PROJECT WORK (06CH85)

"Studies on usage of Ion Exchange process for Recovery of Copper From wire Drawing Industry Effluent and Reduction of Iron Concentration in Bronze Bath"

(sponsored by K.S.C.S.T Bangalore)

Submitted in partial fulfillment of the requirements for the award of the degree of

**BACHELOR OF ENGINEERING
IN
CHEMICAL ENGINEERING**

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1. ABSTRACT

M/S ARADHYA STEELS PVT. LTD., Anagodu village, Davangere taluk, is a medium scale wire drawing unit, producing high tensile steel wires of 1.5 to 4.00 mm diameter by successive heat treatment and wire drawing operations. These steel wires are further subjected to electroplating/ electrolessplating process to deposit copper / chromium suitable for clutch plate, break lining, tyre manufacturing applications etc. Further the concentration of iron increases in the electrolytic bath during the process and interferes in copper deposition and affects the quality of copper deposition. Hence modest efforts have been made to develop a method to control iron concentration in the electrolyte bath to required level.

H₂O₂ method, air blow method and chelation method we were studied. out of these methods studied chelation by the addition of glycine gave successful result. The addition of 20 ml/L of glycine to 1 L of Bronze bath reduced the iron concentration 5.76 gm/L. which is highly desirable for plating operation.

During electroplating operations large amounts of effluent which contains copper, iron, chromium ions are produced. As copper and chromium are precious, recovery has to be done before final disposal.

The removal of copper from bronze bath was carried out by ion exchange method using selected resins such as Indion 820 and Indion 850. The proposed method is pH dependent and shows maximum recovery of Copper (86.5 %) in the pH range 1 to 6.