

Electroless Plating

Aim: To study Electroless plating of Nickel on Copper.

Requirements: Beakers, watch glass, volumetric flask, glass rods, Nickel Sulphate, Sodium Acetate, Sodium Hypophosphite, Lead Acetate, Copper plate, distilled water.

Theory: Electroless plating is defined as auto catalytic deposition of metal/alloy from an aqueous solution of its ions by interaction with a chemical reducing agent. The reducing agent provides electrons for the metal ions to be neutralized. The reduction is initiated by the catalyzed surface of the substrate and continues by the self catalytic activity of the deposited metal/alloy.

There are four basic ingredients of an electroless bath: Metal salt, Reducing agent, Complexant and pH adjustors.

Procedure: Preparation of bath solution: 28g of Nickel Sulphate, 17g of sodium Acetate, 24g of Sodium Hypophosphite and 0.0015g of lead Acetate was dissolved in distilled water. The solution was made upto one litre by maintaining the pH at 5. The temperature of bath solution was maintained at 93 degree centigrade. Copper plate is washed well with distilled water dried and weighed and then immersed in the bath solution for plating for 60 minutes, temperature is maintained at 93 degree.

Remove the plate from the bath solution wash, dry and weigh the copper plate.

Observations:

- 1) Weight of the copper plate before plating (W1) = _____g.
- 2) Weight of the copper plate after plating (W2) = _____g.
- 3) Amount of Ni deposited (W) = $W2 - W1$ on the copper plate = _____g.

Result: The amount of Ni deposited on copper plate is _____g.