interference shielding.

11 ELECTROLESS PLATING OF COPPER

(*a*) *Pretreatment and Activation of the surface.* The surface to be treated is degreased and etched in acid. On gold, silver, platinum, palladium, rhodium, iron, cobalt and nickel, electroless copper gets deposited spontaneously in presence of reducing agents. But Insulators like plastics, printed circuit boards and glass are activated by dipping first in stannous chloride and then in Palladium chloride.

(*b*) *Plating bath solution.* A solution of copper sulphate (12 gm/L) ; formaldehyde (8 gm/L) as reducing agent ; sodium hydroxide (15 gm/L) and rochelle salt (14 g/L) as buffer ; EDTA as complexing agent and exaltant (20 gm/L).

pH of plating bath solution : 11

Temperature of plating bath solution : 25° C.

(*c*) *Reactions*

At Cathode : $Cu^{2+} + 2e^- \longrightarrow Cu$

At Anode : $2\,HCHO + 4\,OH^- \longrightarrow 2\,HCOO^- + 2\,H_2O + H_2 + 2e^-$

Overall reaction : $Cu^{2+} + 2\,HCHO + 4\,OH^- \xrightarrow[\text{Surface}]{\text{Catalyst}} 2\,HCOO^- + 2\,H_2O + H_2$

Cu^{2+} ions and formaldehyde consumed during plating are replenished periodically.