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Title: **A New non-cyanide electroplating bath**

Author(s): Masoud RafiZadeh *, Majid Bahmani Makvandzadeh, Reza Takjoo Chelaras

Address: Tehran, Chemistry Dept., Tarbiat Moalem University, Shahid Moffateh Ave.

Due to the good thickness and stickness of the deposit layer obtained using cyanide electroplating bath many industrial plating of such metals as gold, silver and copper are carried out in these baths. However, environmental hazards and health risk to the workers associated with cyanide baths is of great concern.

In this paper the results of experiments for deposition of copper in a new electroplating bath is described. In the new bath use is made of lactic acid as the complexing agent to produce copper lactate.

In the new electroplating bath the effect of the following experimental conditions on the deposit layer quality and the bath condition has been considered:

(1) Connect/disconnect cycles of the current (2) anode/cathode surface area ratio (3) mixing effects in the bath (4) electrolyte concentration (5) pH (6) temperature (7) effect of electroplating additives.

The new bath has the following formulation:

Copper sulphate. sodium hydroxide, lactic acid, boric acide

After preliminary tests to determine the optimum bath conditions the quality of deposit layer and the bath conditions were compared with the standard bath.

The following Table shows the comparison between standard cyanide and the new bath:

Copper lactate bath	Cyanide bath	Deposit layer and bath condition
clear	Strong	Deposit layer colour
2μm and uniform	3-4μm and non-uniform	Deposit layer thickness (for same deposition time)
Blue	Transparent	Bath colour
None	Some	Particulate matter in the bath
Copper or steel	Copper	Anode type
160 mA	350 mA	Current
Stable	Unstable	Bath stability with time
Cheap	Expensive	Cost

Reference

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