

Cyanides-free electrolytes for metal coatings: basic principles, recent developments and future trends

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Abstract

Cyanide-containing electrolytes are widely used, despite the risk of toxicity of components and increasing environmental regulation. Indeed, even if it is not formally covered by national or European legislation, the use of cyanides raises concerns. The "green" image expected by customers in luxury, the desire to simplify ranges without having to worry about the storage area or a particular wastewater treatment plant, and finally the existence of strict rules on cyanide bath volumes at a single site, which may lead to classification as a Seveso site, imposing additional constraints on all production are sufficient issues.

But if we are looking for alternatives, we must first ask ourselves the question of the qualities that make cyanide baths so attractive! What are the mechanisms of action of cyanides, which make the baths so stable and nevertheless suitable for electroplating?

How can we, despite the strong values of complexation constants, succeed in making alloy coatings from cyanides baths?

We will explore new paths leading to cyanides free formulations and the difficulties that may be encountered on this occasion, starting with silver, and extending our quest to silver alloys and other metals.