

Non-Cyanide Electrolytes for Gold Plating – A Review

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Nowadays, the cyanide and ferrous cyanide solutions are used in practice for gold plating. The traditional baths employed for soft gold as well as hard gold plating contain the cyanide complex, $[\text{Au}(\text{CN})_2]^-$, as the source of gold, which release free cyanide ions during the plating. Those compounds are very toxic, and formation and maintenance of cyanide baths is expensive and risky for technical personnel; also, they attack photoresists used to delineate circuit patterns and bonding pads. Due to this reason, and especially in modern time, there is a trend of using the electrolytes without content of cyanides. These electrolytes are mainly based on some organic compounds. This article is an overview of the non-cyanide electrolytes for gold plating introduced into practice or only tested in the laboratory. The large number of investigated complexes fulfils the coating quality requests, but there are problems related to their stability. Decorative gold plating obtained from classic cyanide electrolyte and an electrolyte based on mercaptotriazole have shown similar characteristics such as microhardness, surface roughness, visual appearance and adhesion. At the same time, this bath remained stable in a period of at least nine months.

Keywords: Electroplating, Gold baths, Stability constants, Complexing ligands, Photoresists, Soft gold

1. INTRODUCTION

The history of gold deposition began in the early nineteenth century when many art objects were electroplated with gold. It has been traced to the early work of Brugnatelli in 1805 [1]. Gold electroplating formulations based on the double salt gold potassium cyanide was patented in 1840. Since then, many types of gold formulations have been produced to meet the market requirements. Due to the changing trends in fashion, the application of certain colours or shades of the electroplated gold can only last for about forty years [2, 3]. The electronics industry began its development in the 1940's and 1950's; during this period, platters faced new demands for deposits with different properties,

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A red circular graphic with a gradient, appearing as a semi-circle or a partial circle, located to the right of the author's name.

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Modern Technology of Acid Slurry, Surfactants, Soap and Detergents with Formulae , *Chemical Resistance of Thermosets* Erwin Baur, Katja Ruhrberg, William Woishnis, 2018-04-27 Chemical Resistance of Commodity Thermoplastics provides a comprehensive cross referenced compilation of chemical resistance data that explains the effect of thousands of reagents the environment and other exposure media on the properties and characteristics of thermosets plastics which are used in a range of applications Specifically the resistance data in this book covers the following materials allyl epoxy unsaturated polyester resin unsaturated polyurethane resin vinyl ester resin furan resin polyaminobismaleimide acrylics polycyanurates and filled reinforced thermosets A huge range of exposure media are included from aircraft fuel to alcohol corn syrup hydrochloric acid and salt to silver acetate This book is a must have reference for engineers and scientists designing and working with thermosets in environments where they come into contact with corrosive or reactive substances from automotive and aerospace to coatings adhesives electrical insulation fittings and other applications Presents comprehensive comparable and trustworthy chemical resistance data for thousands of exposure media on the properties of thermosets Includes coverage of ionomers polyethylene polypropylene polystyrene PVC and other polyolefins and polyesters Provides a must have reference for engineers selecting materials for a range of application areas using thermosets including aerospace automotive chemical process industries coatings and adhesives

Modern Electroplating Mordechai Schlesinger, Milan Paunovic, 2014-12-22 The definitive resource for electroplating now completely up to date With advances in information age technologies the field of electroplating has seen dramatic growth in the decade since the previous edition of Modern Electroplating was published This expanded new edition addresses these developments providing a comprehensive one stop reference to the latest methods and applications of electroplating of metals alloys semiconductors and conductive polymers With special emphasis on electroplating and electrochemical plating in nanotechnologies data storage and medical applications the Fifth Edition boasts vast amounts of new and revised material unmatched in breadth and depth by any other book on the subject It includes Easily accessible self contained contributions by over thirty experts Five completely new chapters and hundreds of additional pages A cutting edge look at applications in nanoelectronics Coverage of the formation of nanoclusters and quantum dots using scanning tunneling microscopy STM An important discussion of the physical properties of metal thin films Chapters devoted to methods tools control and environmental issues And much more A must have for anyone in electroplating including technicians platers plating researchers and metal finishers Modern Electroplating Fifth Edition is also an excellent reference for electrical engineers and researchers in the automotive data storage and medical industries

Comprehensive Materials Finishing M.S.J. Hashmi, 2016-08-29 Finish Manufacturing Processes are those final stage processing techniques which are deployed to bring a product to readiness for marketing and putting in service Over recent decades a number of finish manufacturing processes have been newly

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Audit Study of Gold, Silver, Platinum, and Other Precious Metals Products and Reclamation SCS Engineers,1990

The International Journal of Microcircuits and Electronic Packaging ,1998 Industrial Waste Treatment

Kenneth D. Kerri,1996 This manual is designed to train operators in the safe and effective operation of industrial waste treatment plants It covers the importance and responsibilities of an industrial wastewater treatment plant operator

Information is provided on the importance of being an operator safety waste minimization physical chemical treatment process treatment of metal wastestreams and instrumentation Electroplating & Metal Finishing ,1972 Issues for Jan 1954

Aug 1955 include a section Metal finishing abstracts later issued separately **Proceedings** ,1998 Plating of Plastics

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Pollution

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web mar 7 2018 about design it s been said that good designs evolve and i believe it when i got started in knifemaking i didn t have one clear thought about design i grabbed the only suitable knifemaking material i could find and went to work grinding on it there was no thought as to knife proportions or design principles

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