

Analysis of stabilizers in electroless nickel baths

Sensitive determination of lead, antimony, bismuth, or iodate by voltammetry/polarography

Herisau, December 2021

Many industrial production processes use electroless nickel (EN) plating to prevent wear and corrosion. In the semiconductor industry, EN plating is an essential production step, where the ENIG (electroless nickel, immersion gold) and ENEPIG (electroless nickel, electroless palladium, immersion gold) processes are used for the PCB production. Stabilizers play an important role in electroless nickel plating solutions as they control the plating rate and prevent uncontrolled plate out (decomposition) of the bath. However, it is important to hold the stabilizer concentration at an optimal level. Too low stabilizer levels negatively affect the deposition rate and bath stability. Too high levels can poison the deposition at the edges or stop the plating reaction. Monitoring of the stabilizer concentration is therefore essential for an optimal plating process.

Historically, lead has been used as a stabilizer in electroless nickel baths. Because of restrictions, such as RoHS, on heavy metals in consumer goods, and particularly electronics, alternative stabilizers have become more popular. Common alternatives are antimony, bismuth, or iodate. Anodic stripping voltammetry/polarography is ideal to determine the concentration of all three stabilizers, even in the low mg/L range. Other bath components do not interfere with this selective analysis.



With an 884 Professional VA Analyzer, determination of the stabilizer concentration is straight-forward. Samples can be directly measured after dilution. To learn more about the method, download our free Application Notes on this analysis.

Application Note AN-V-019 – Lead in electroless nickel baths

Application Note AN-V-195 – Iodate in electroless nickel baths

Application Note AN-V-196 – Antimony and bismuth in electroless nickel baths

Weblink: news.metrohm.com

Keywords: voltammetry, polarography, electroless nickel plating, stabilizer, lead, antimony, bismuth, iodate, ENEPIG, ENIG, EN plating

Branches: Printed circuit board, PCB, semiconductor, surface finishing, plating

Image:

About Metrohm

Metrohm is one of the world's most trusted manufacturers of high-precision instruments for laboratory and process analysis. The company was founded in 1943 by engineer Bertold Suhner in Herisau, Switzerland, where it is headquartered to this day. Metrohm offers a comprehensive portfolio of analytical technologies ranging from titration and ion chromatography to near-infrared and Raman spectroscopy, as well as several other techniques. Metrohm sells its products and provides services through its own local subsidiaries and exclusive distributors in more than 120 countries worldwide. Our mission in a nutshell is helping customers from virtually every industry analyze and maintain the quality of their products at every stage in the manufacturing process and beyond. Since 1982, Metrohm has been owned 100% by the non-profit Metrohm Foundation. This foundation keeps to its purpose to support charitable, philanthropic, and cultural projects in eastern Switzerland and, above all, ensure the independence of the company.

Contact

Roman Moser

Marketing Communication

Metrohm AG Herisau

+41 71 353 86 68

roman.moser@metrohm.com

