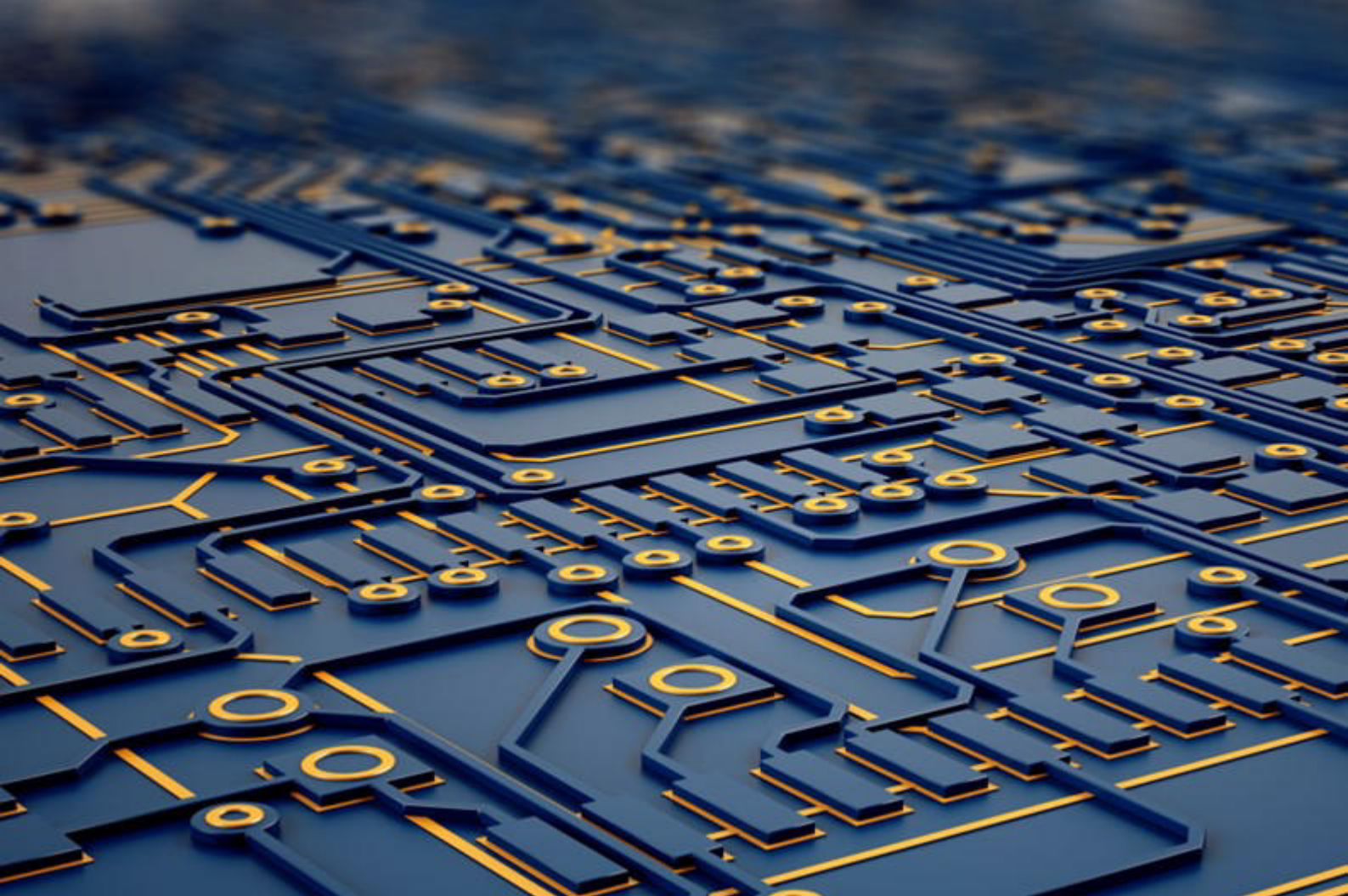




Application Note AN-V-238

无电解镍镀液中的铋稳定剂

Straightforward determination over a wide concentration range with the scTRACE Gold

The electroless nickel plating process is known for its superior surface finishing properties with excellent resistance to wear and corrosion. The efficiency of the ENIG (electroless nickel, immersion gold) and ENEPIG (electroless nickel, electroless palladium, immersion gold) processes in manufacturing printed circuit boards strongly depends on the exact composition of the electroless nickel plating bath. Monitoring stabilizer concentrations in Ni baths (e.g., bismuth, Bi) is crucial for high-quality coatings. Anodic stripping voltammetry (ASV) allows fast

and robust monitoring of the bismuth concentration in Ni plating bath samples. This determination is performed on the scTRACE Gold. It is a combined sensor containing working, reference, and auxiliary electrodes integrated on a single ceramic substrate. It does not need extensive maintenance such as mechanical polishing. Measurements can be performed with the 884 Professional VA. This method is suited for manual or automated systems.

SAMPLE

Electroless Ni plating bath

EXPERIMENTAL

Add water, the electroless Ni plating bath sample, and the supporting electrolyte into the measuring vessel. The determination of bismuth is carried out with the 884 Professional VA (Figure 1) using the parameters specified in Table 1. The concentration is determined by two additions of a bismuth standard addition solution.

The scTRACE Gold is electrochemically activated prior to the first determination.



Figure 1. 884 Professional VA, fully automated for voltammetric analysis.

Table 1. Parameters

Parameter	Setting
Mode	DP – Differential Pulse
Deposition potential	-0.1 V
Deposition time	30 s
Start potential	0.0 V
End potential	0.3 V
Peak potential Bi	0.15 V

ELECTRODES

- scTRACE Gold

RESULTS

The typical Bi concentration in nickel plating bath samples is around 1 mg/L. However, samples containing 100 µg/L Bi can be reliably determined with a 30 s deposition time using this method. The scTRACE Gold sensor quickly measures bismuth in Ni baths over a broad concentration range.

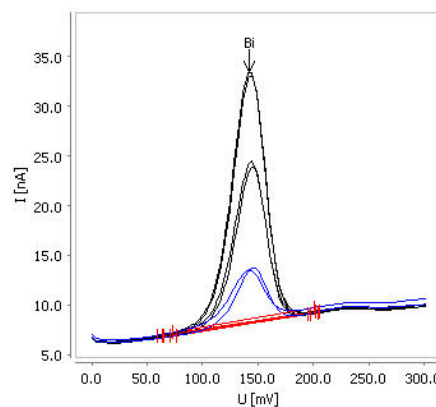


Figure 2. Determination of bismuth in an electroless Ni bath sample containing 1 mg/L Bi (30 s deposition time, sample volume 25 µL in 10 mL water).

Table 2. Result

Sample	Bi (mg/L)
Electroless Ni plating bath containing 1 mg/L Bi	1.07

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CONFIGURATION



(MME) 884 Professional VA manual

用于多模式电极 (MME) 的 884 Professional VA manual 是借助多模式电极 pro 或 scTRACE Gold 或 铋液滴电极使用伏安法和极谱法进行痕量分析的入门仪器。此项已经证实的瑞士万通电极技术与恒电位/恒电位仪以及外接的灵活 viva 软件联用,在重金属测定领域中展现了新的前景。带有经认证的校准器的恒电位仪在每次测量之前均自动冲洗进行校准,确保可能的高精度。

通过此仪器也可使用旋转圆盘电极进行测定,例如借助«循环伏安溶出法»(CVS)、«循环脉冲伏安溶出法»(CPVS)和计时电位法(CP)测定电镀池中的有机添加剂。借助可更换的测量头,可在使用不同电极的各种应用之间实现快速切换。

使用 **viva** 软件进行控制、数据采集和评估。

用于 MME(多模式电极)的 884 Professional VA manual 供货时配备大量附件,包括用于多模式电极 pro 的测量头。电极组和 **viva** 许可证则须单独订购。