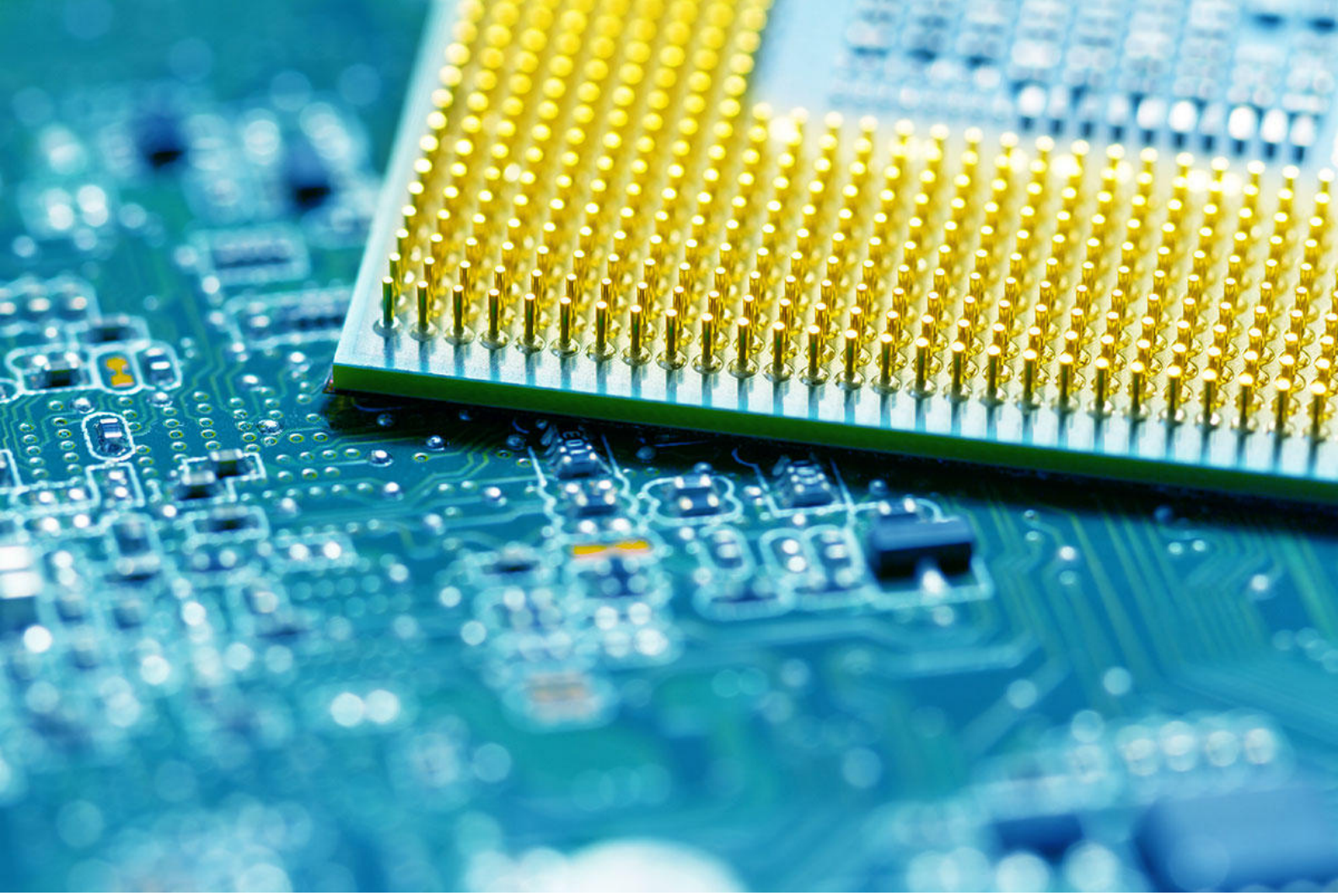

Application Note AN-V-199

Voltammetric determination of gold(I) in gold plating baths

Gold plating bath analysis with the Multi-Mode Electrode pro

In the metal plating industry, particularly during gold electroplating, the meticulous control and determination of gold(I) concentration in the gold plating bath is critical. This not only ensures a high quality and consistent thin layer of gold, but also plays a significant role in optimizing the efficiency and cost of gold plating.

The conversion of Au(I) to pure gold metal is relatively simple and efficient, using one unit of electricity per mole of gold deposited. However, when Au(III) forms and accumulates in the gold bath, it significantly lowers the current efficiency because the reduction of Au(III) to gold metal requires three units per mole. A lower fraction of Au(I) leads to inefficient use of electricity and gold, making the process more costly and less sustainable.

Voltammetric analysis using the Multi-Mode Electrode pro emerges as a highly effective tool, offering a direct and straightforward method for the determination of gold(I) in both cyanide and sulfite gold plating baths without the need for time-consuming sample preparation.

SAMPLE

Gold cyanide bath Gold sulfite bath

EXPERIMENTAL

Add the electrolyte solution into the measuring vessel and degas it for 5 min. In the next step, add the gold plating bath sample. The determination is carried out using the parameters listed in **Table 1**. Quantification is done with the 884 Professional VA manual for MME (**Figure 1**) using two Au(I) standard solutions.

Figure 1. 884 Professional VA manual for MME

Table 1. Parameters

Parameter	Setting
Mode	DME
Start potential	-0.9 V
End potential	-1.75 V
Sweep rate	15 mV/s
Peak potential Au(I)	-1.45 V

ELECTRODES

- Multi-Mode Electrode pro

RESULTS

Figure 2 presents results of Au(I) determination in a gold sulfite plating bath.

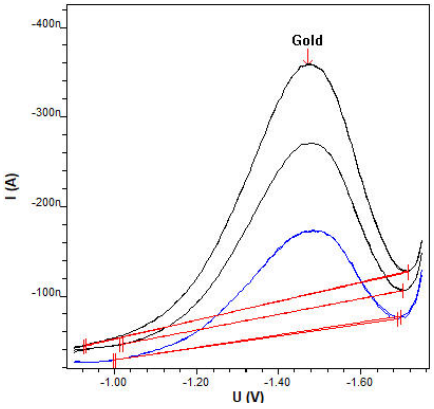

Figure 2. Determination of Au(I) in a gold sulfite plating bath, β(Au(I)) = 12.1 g/L

Table 2. Result

Sample	Au(I) in g/L
Gold cyanide plating bath	1.6
Gold sulfite plating bath	12.1

Internal references: AW CH4-0498-052010, AW CH4-0412-082004

CONTACT

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CONFIGURATION

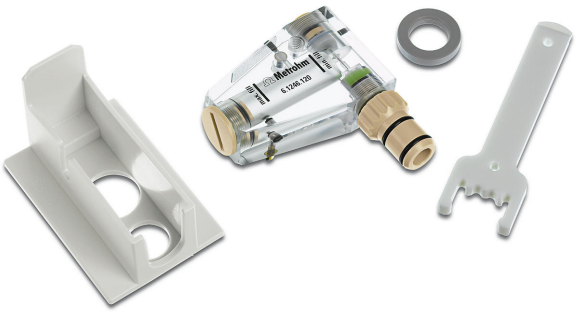
(MME) 884 Professional VA manual

用于多模式（MME）的 884 Professional VA manual 是借助多模式 pro 或 scTRACE Gold 或液滴使用伏安法和法行痕量分析的入器。此已的瑞士万通技与恒位/恒位以及外接的活 viva 件用,在重金属定域中展了新的前景。有的校准器的恒位在每次量之前均自冲洗行校准,保可能的高精度。

通此器也可使用旋行定,例如借助«循伏安溶出法»(CVS)、«循脉冲伏安溶出法»(CPVS)和位法(CP)定池中的有机添加。借助可更的量,可在使用不同的各用之快速切。

使用 viva 件行控制、数据采集和估。

用于 MME(多模式)的 884 Professional VA manual 供配大量附件,包括用于多模式 pro 的量。和 viva 可独。



Multi-Mode-Electrode pro

用于伏安法的汞。可作 DME、SMDE 或 HMDE 使用。