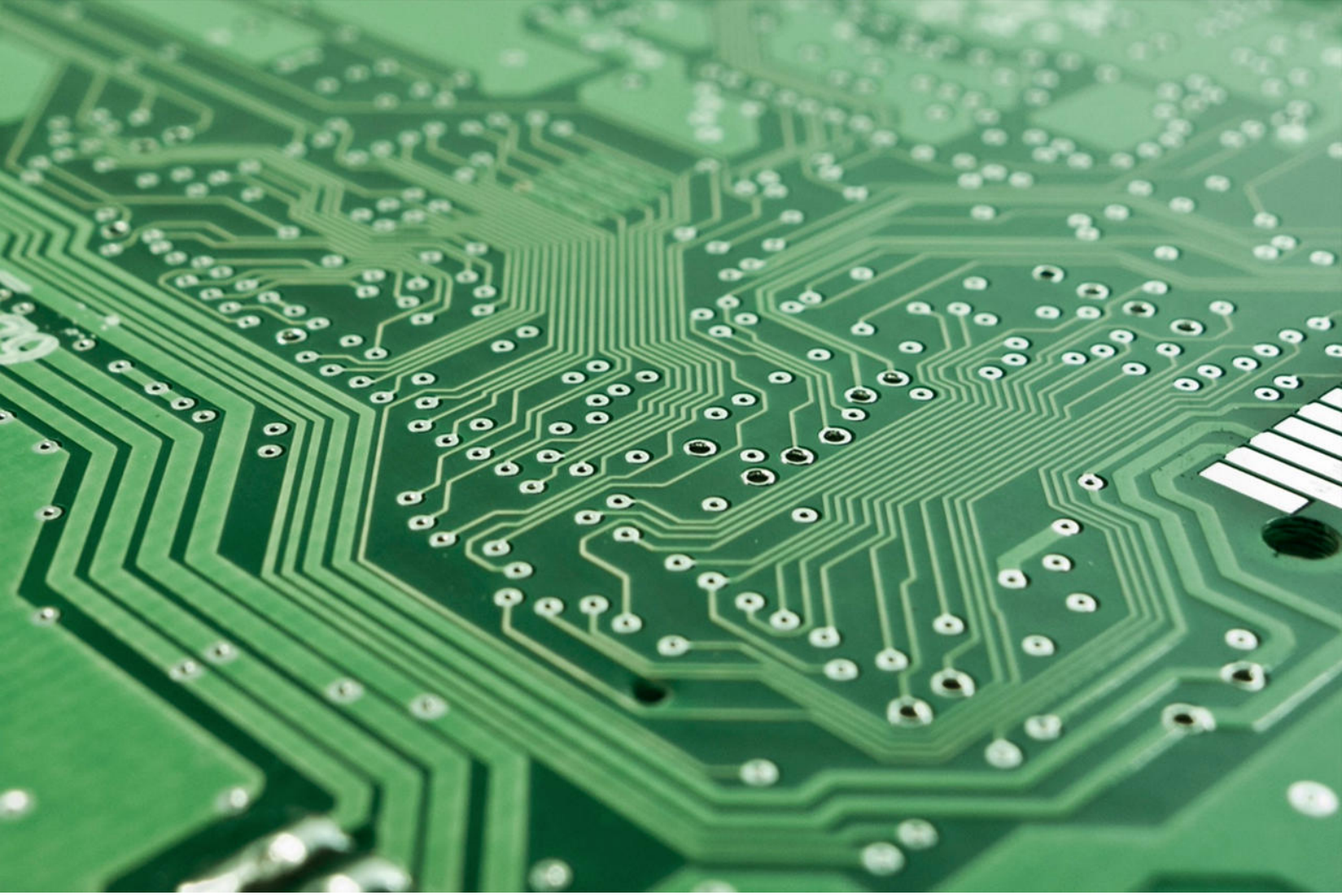


Application Note AN-T-100

酸性铜浴中的氯化物的测定

Fully automated determination

Acid copper baths are mainly used for the copper deposition on semiconductor wafers. Small amounts of chloride increase the speed of deposition and reduce anode polarization. However, higher concentrations are undesired, as this will decrease the quality of the copper deposition. Therefore, it is quite important to monitor the amount of chloride to have an effective, yet high-quality copper deposition process.

In this Application Note, a fully automated solution based on titration is presented. In comparison to ion chromatography, titration offers the benefit that no dilution of the sample is necessary, and the hardware is comparatively low-priced. Furthermore, the fully automated solution allows users to minimize handling errors, to reduce workloads, and to guarantee outstanding reproducibility.

SAMPLE AND SAMPLE PREPARATION

The method is demonstrated for an acid copper bath. No specific sample preparation is required.

EXPERIMENTAL

This analysis is carried out on an automated system consisting of an 814 Sample Processor and a 905 Titrando equipped with an iAg-Titrode with Ag_2S coating.

To a reasonable amount of sample, 5 mL of nitric acid is added to acidify the sample. Then, deionized water is added to cover the glass membrane and silver ring of the electrode, and the sample is titrated with standardized silver nitrate titrant until after the equivalence point.



Figure 1. 814 Sample Processor and 905 Titrando equipped with an iAg-Titrode with Ag2S coating controlled by tiamo software.

RESULTS

The analysis demonstrates an acceptable result and well-defined titration curves. The sample analyzed contained 49.17 mg/L chloride with a relative standard deviation of 0.31% (n = 10). An example titration curve is displayed in Figure 2.

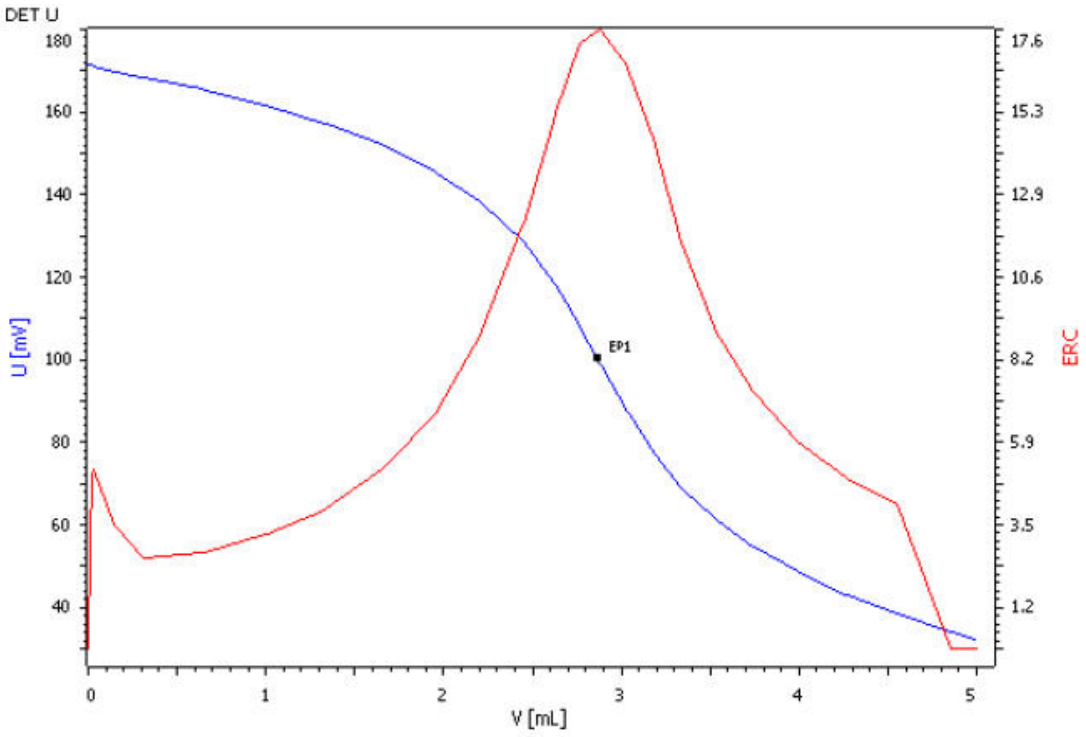


Figure 2. Example titration curve of the chloride determination in an acid copper bath.

CONCLUSION

Titration is a precise and reliable method to determine the chloride content in acid copper baths.
Using the 814 Sample Processor allows a fully automated determination, freeing up valuable time of the operator and thus increasing the productivity in the lab. Furthermore, by fully automating the analysis, the reproducibility can be increased and sample analysis failures due to improper handling can be reduced.

Internal reference: AW TI CH1-1130-022013

CONTACT

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CONFIGURATION



905 Titrando
用于使用 Dosino 加液系统通过一个测量接口滴定分析的电位滴定仪。

- 多达四套 800 Dosino 加液系统
- 动态等当点滴定(DET)、等量等当点滴定(MET)和终点设定滴定(SET)
- 使用离子选择性电极测量(MEAS CONC)
- 带监控的加液功能,LQH
- 用于额外搅拌器或加液器系统的四个 MSB 接口
- 智能电极“iTrode”
- USB 接口
- 使用 OMNIS-Software、*tiamo*-软件或 Touch Control
- 如果需要,满足 GMP/GLP 和 FDA 要求,比如 21 CFR 第 11 部分

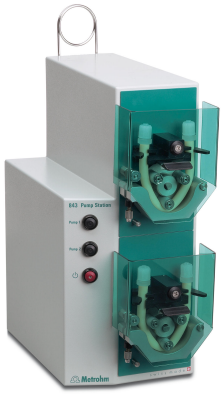


814 USB Sample Processor (1T/0P)

USB Sample Processor 包括一个工作站,可用于自动处理少量至中等量的常规样品系列。还可再连接多达两台泵(隔膜泵或蠕动泵)和三台加液器用来进行 LQH 加液处理。

由于其应用范围很广,因此必须根据具体应用来选择合适的样品盘、搅拌器、滴定头和 Swing Head 以及样品容器并单独订购。

通过 Touch Control 实现单机控制。 有以下 PC 控制用软件产品可供选择: 滴定软件 tiamoTM、色谱分析软件 MagIC Net、伏安法软件 viva 或 OMNIS。



Sample Processor 843 Pump Station– rinse/aspirate

843 Pump Station(蠕动泵式)带两个内置的蠕动泵,可直接由 Sample Processor 自动进样器通过泵命令来控制。冲洗/抽吸(rinse/aspirate)变型中包含了用于自动清空滴定杯和清洗滴定装备的完整配件。此附件设计用于与 814 和 815 Sample Processor 一起使用。



iAg Titrode Ag2S

带 pH 玻璃膜且集成了传感器数据存储芯片的智能组合式银环形电极,用作参比电极。

银环具有硫化物 (Ag_2S) 涂层,其适用于较高的灵敏度和更好的指示极限。

该免维护电极适用于 pH 值恒定的沉积滴定(硝酸银滴定剂),例如:

- 氯化物、溴化物、碘化物
- 硫化物
- 硫化氢
- 硫醇
- 氰化物

该电极存放在蒸馏水中。

iTrodes 可以在 Titrando、Ti-Touch 或 913/914 Metern 上使用。