



Application Note AN-V-215

使用 scTRACE Gold电极 检测饮用水中的锌

Straightforward determination over a wide concentration range with the scTRACE Gold

At zinc concentrations above 3 mg/L, the quality of drinking water deteriorates, and an undesirable astringent taste is detectable. No health-based guideline value is required for zinc as it is an essential trace element for humans. The United States Environmental Protection Agency (US EPA) has set a maximum concentration of 5 mg/L as the limit value of Zn in drinking water.

The anodic stripping voltammetric method with an overall determination time of less than 10 minutes is fast, very sensitive, and can be applied for a wide range of concentrations. Without applying any deposition time, the limit of

detection is around 1 µg/L. This value can be lowered further when the deposition time is increased. When a reductive determination is carried out, the linear range of the method can be extended to 1.5 mg/L. The excellent performance of the method is due to the unique design and architecture of the scTRACE Gold electrode. This sensor does not require extensive maintenance such as mechanical polishing. Measurements can be performed in the laboratory or alternatively in the field. This method is suited for manual and automated systems.

SAMPLE

Drinking water, mineral water

EXPERIMENTAL

The water sample and the supporting electrolyte are pipetted into the measuring vessel. The determination of zinc is carried out with the 884 Professional VA or with the 946 Portable VA Analyzer using the parameters specified in **Table 1**. The concentration is determined by two additions of a zinc standard addition solution.

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



Figure 1. 946 Portable VA Analyzer



Figure 2. 884 Professional VA fully automated for VA analysis

Table 1. Parameters

Parameter	Setting
Mode (884) Mode (946)	DP – Differential Pulse SQW – Square wave
Start potential	-1.05 V
End potential	-0.45 V
Peak potential Zn	0.06 V

ELECTRODES

- scTRACE Gold

RESULTS

Without deposition time, this method is suitable for the determination of zinc in water samples in

concentrations from $\beta(\text{Zn}) = 1\text{--}50 \mu\text{g/L}$.

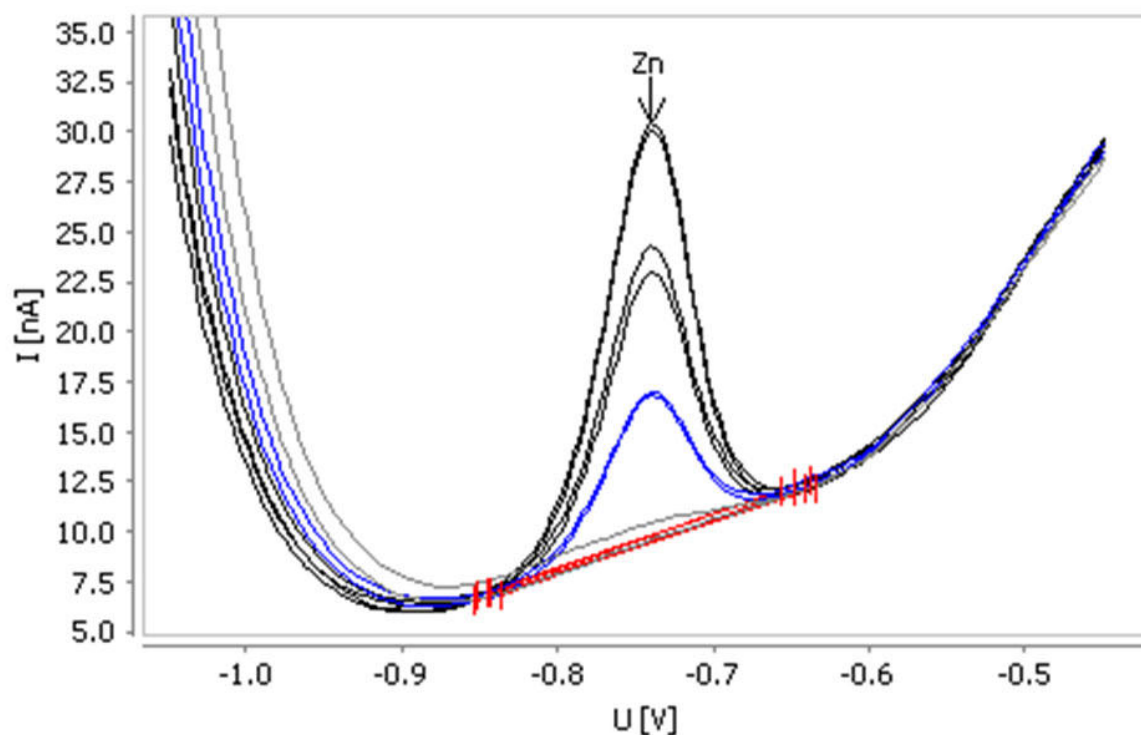


Figure 3. Determination of zinc in mineral water spiked with 10 µg/L (0 s deposition time)

Table 2. Results

Sample	Zn (µg/L)
Mineral water spiked with 10 µg/L Zn	10.8

Internal references: AW VA CH4-0573-112018;

AW VA CH4-0575-122018

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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。



VA scTRACE Gold Professional VA

整套电极组,用于测定砷或汞。包括用于 scTRACE Gold、scTRACE Gold、搅拌器和量杯的支架。



946 Portable VA Analyzer (scTRACE Gold)

用于测定重金属,如痕量砷,汞,铜,铅,锌,镍,钴,铁、铋或铈之类重金属的便携式金属分析器。scTRACE Gold 适用的仪器版本。该系统由恒电位仪和集成了搅拌器与可更换式电极的独立测量台构成。该设备用 Portable VA Analyzer 软件驱动。电源由 USB 接口和内置的可充电电池提供。设备装在手提箱内交付,包含所有必需的附件。