



Application Note AN-V-226

使用玻璃碳电极检测饮用水中的锌含量

An ultra-sensitive method for a wide concentration range on the mercury film modified glassy carbon electrode

No health-based guideline value exists for zinc. However, to maintain good quality municipal drinking water, the United States Environmental Protection Agency (US-EPA) set a maximum concentration of 5 mg/L as the limit value. Typical concentrations in surface and ground waters are between 10–40 µg/L Zn. In tap water, this value can be up to 1 mg/L due to leaching of zinc from piping and fittings.

Anodic stripping voltammetry (ASV) on the ex-

situ mercury film modified glassy carbon electrode provides a less complex alternative to atomic absorption spectroscopy (AAS) for zinc determination in drinking water. The main advantage of this method is the high sensitivity. With a deposition time of 10 s, the limit of detection for zinc is 0.15 µg/L. The linear working range goes up to approximately 300 µg/L. This method is suited for manual and automated systems.

SAMPLE

Drinking water, mineral water, sea water

EXPERIMENTAL

Prior to the first determination, the ex-situ mercury film is deposited on a freshly polished glassy carbon electrode. In the next step, the electrodes are cleaned with ultrapure water and the measuring vessel is emptied. Then 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 using the parameters specified in **Table 1**. The concentration is determined by two additions of a zinc standard addition solution.



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

Table 1. Parameters

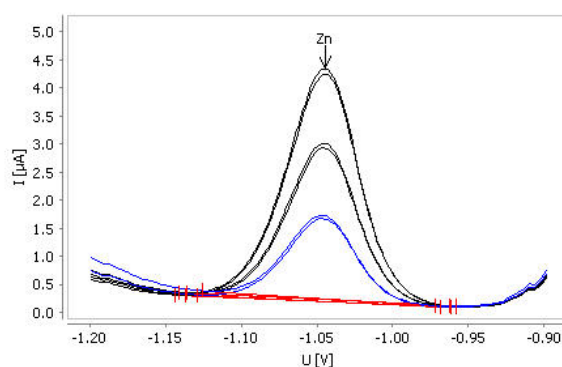
Parameter	Setting
Mode	DP – Differential Pulse
Deposition potential	-1.4 V
Deposition time	10 s
Start potential	-1.2 V
End potential	-0.9 V
Peak potential Zn	-1.05 V

ELECTRODES

- Working electrode: Glassy carbon (GC-RDE)
- Reference electrode: Ag/AgCl/KCl (3 mol/L)
- Auxiliary electrode: Glassy carbon rod

RESULTS

With the deposition time of 10 s, the method is suitable for samples between 10–150 µg/L zinc.

**Figure 2.** Determination of zinc in tap water (10 s deposition time)**Table 2.** Result

Sample	Zn (µg/L)
Tap water	112

REFERENCES

Application Bulletin 254: Determination of zinc, cadmium and lead by anodic stripping voltammetry at a mercury film electrode

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CONFIGURATION



CVS 884 Professional VA manual

用于 CVS 应用的 884 Professional VA manual 是借助 «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)在电镀池中对有机添加剂进行测定或采用旋转圆盘电极进行伏安法重金属测定的入门仪器。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,展现了新的 CVS 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,确保精度。集成的温度测量输入端可在测量过程中监控溶液温度。

通过此仪器也可以进行伏安法测定。借助可更换的测量头,可在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 CVS(伏安测量)应用的 884 Professional VA manual 供货时带有大量附件,以及用于旋转圆盘电极的测量头。电极组和 **viva** 许可证则须单独订购。



VA Glassy Carbon RDE Professional

VA

整套电极组,用于伏安测定,例如采用汞膜电极技术。
包含旋转圆盘电极驱动、玻碳电极头、参比电极、玻
碳辅助电极、量杯和电解质溶液。