



Application Note AN-V-234

饮用水中的碲(IV)

Direct determination in low $\mu\text{g/L}$ range on the scTRACE Gold

Tellurium is one of the elements recently identified as technologically critical for photovoltaic conversion, quantum dots, as well as in thermoelectric technology, and has the potential to become a new emergent contaminant. Until now there is no guideline value in the World Health Organization's «Guidelines for Drinking-water Quality» and in the European Drinking Water Directive for tellurium(IV) concentration in drinking water.

To monitor the tellurium(IV) levels in drinking water, anodic stripping voltammetry (ASV) performed on the unmodified scTRACE Gold is recommended. This method allows

determination of tellurium(IV) in the concentration range between $1 \mu\text{g/L}$ and $60 \mu\text{g/L}$ when using a 90 s deposition time.

The advantage of this method lies in the innovative and cost-effective sensor used for this application: the scTRACE Gold. It is a combined sensor containing the working, reference, and auxiliary electrode integrated on a single ceramic substrate. The scTRACE Gold electrode does not need extensive maintenance such as mechanical polishing. Measurements can be performed in the laboratory with the 884 Professional VA or alternatively in the field with the 946 Portable VA Analyzer.

SAMPLE

Drinking water, mineral water

EXPERIMENTAL

The scTRACE Gold is electrochemically activated prior to the first determination. In the next step, the water sample and the supporting electrolyte are pipetted into the measuring vessel. The determination of tellurium(IV) 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 tellurium(IV) standard addition solution.



Figure 1. 946 Portable VA Analyzer (scTRACE Gold)



Figure 2. 884 Professional VA, semiautomated for VA analysis

Table 1. Parameters

Parameter	Setting
Mode	DP – Differential Pulse
Deposition potential	-0.3 V
Deposition time	90 s
Start potential	0.1 V
End potential	0.8 V
Peak potential Te	0.475 V

ELECTRODES

- scTRACE Gold

RESULTS

At a 90 s deposition time, this method is suitable for the determination of tellurium(IV) in water samples in concentrations of $\beta(\text{Te(IV)}) = 1\text{--}30$

$\mu\text{g/L}$ using the 884 Professional VA and $\beta(\text{Te(IV)}) = 2\text{--}75 \mu\text{g/L}$ using the 946 Portable VA Analyzer.

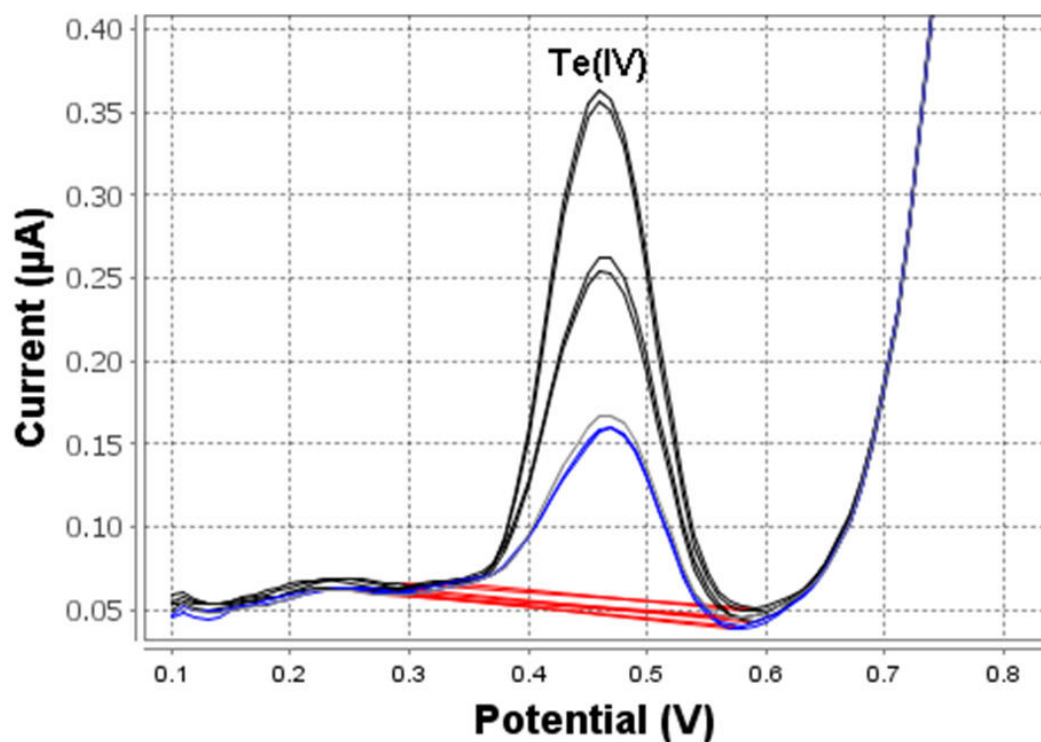


Figure 3. Determination of Te(IV) in mineral water spiked with 10 µg/L (946 Portable VA Analyzer; 90 s deposition time)

Table 2. Results of Te measured in a spiked mineral water sample

Sample	Te(IV) (µg/L)
Mineral water spiked with 10 µg/L	11.5

Internal references: AW VA CH4-0600-082020,

AW VA CH4-0602-092020

CONTACT

Metrohm Taiwan Ltd.
開封街二段 46 號 5 樓
108 台北市

info@metrohm.com.tw

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。