Application Note AN-V-234

用水中的(IV)

Direct determination in low µg/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 µg/L and 60 µg/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.

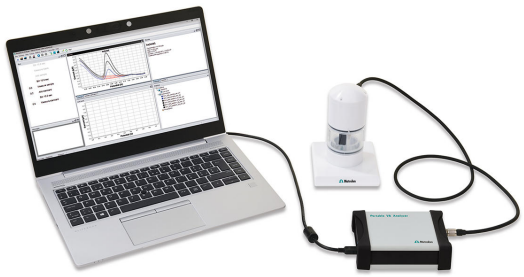

Figure 1. 946 Portable VA Analyzer (scTRACE Gold)

EXPERIMENTAL

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

At a 90 s deposition time, this method is suitable for the determination of tellurium(IV) in water samples in concentrations of β(Te(IV)) = 1–30 µg/L using the 884 Professional VA and β(Te(IV)) = 2–75 µg/L using the 946 Portable VA Analyzer.

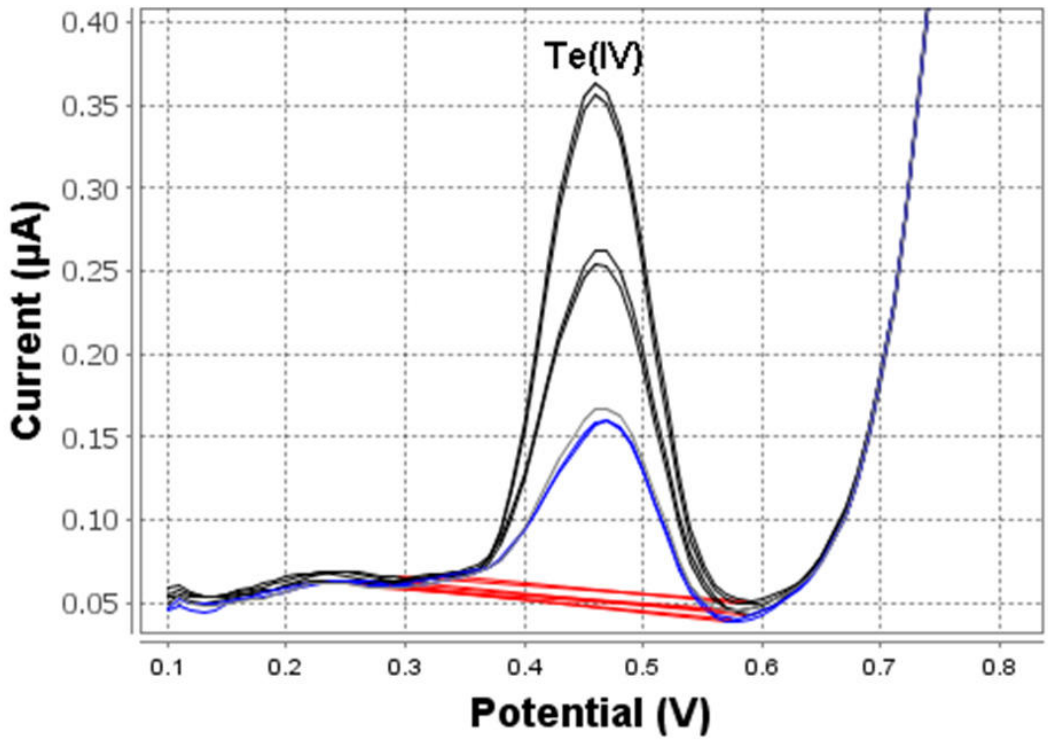

Figure 3. Determination of Te(IV) in mineral water spiked with 10 µg/L (946 Portable VA Analyzer; 90 s deposition time)

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

RESULTS

Internal references: AW VA CH4-0600-082020, AW VA CH4-0602-092020

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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。

VA scTRACE Gold Professional VA

整套,用于定或汞。包括用于 scTRACE Gold、scTRACE Gold、拌器和量杯的支架。

946 Portable VA Analyzer (scTRACE Gold)

用于定重金属,如痕量,汞,,,,,,、或之重金属的便携式金属分析器。scTRACE Gold 用的器版本。系由恒位和集成了拌器与可更式的独立量台成。用 Portable VA Analyzer 件。源由 USB 接口和内置的可充池提供。装在手提箱内交付,包含所有必需的附件。