



Application Note AN-V-211

Arsenic(III) in mineral water

Sensitive and selective determination by voltammetry using a gold microwire electrode

Arsenic is ubiquitous in the earth's crust in low concentrations. Elevated levels can be found in mineral deposits and ores. Arsenic from such deposits leaches into the groundwater in the form of arsenite (AsO_3^{3-}) and arsenate (AsO_4^{3-}), causing its contamination. As(III) is more toxic than As(V) and shows higher mobility in the environment. The selective determination of this species is possible using the method described in this document.

With a limit of detection (LOD) of $0.3 \mu\text{g/L}$, anodic stripping voltammetry allows speciation, i.e. the specific determination of As(III). While atomic absorption spectroscopy (AAS) (and competing methods) can only determine the total element concentration, anodic stripping voltammetry is selective to the As(III) oxidation state. The determination is carried out on the scTRACE Gold electrode.

SAMPLE

Bottled 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 arsenic 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 an arsenic standard addition solution.



Figure 1. 946 Portable VA Analyzer (scTRACE Gold version)



Figure 2. 884 Professional VA fully automated for VA

Table 1. Parameters

Parameter	Setting
Mode	SQW – Square wave
Deposition potential	-0.5 V
Deposition time	60 s
Start potential	-0.3 V
End potential	0.4 V
Peak potential As	0V

ELECTRODES

- scTRACE Gold

RESULTS

With a 60 s deposition time, this method is suitable for the determination of arsenic in

water samples in concentrations from β (As(III)) = 0.3–10 $\mu\text{g/L}$.

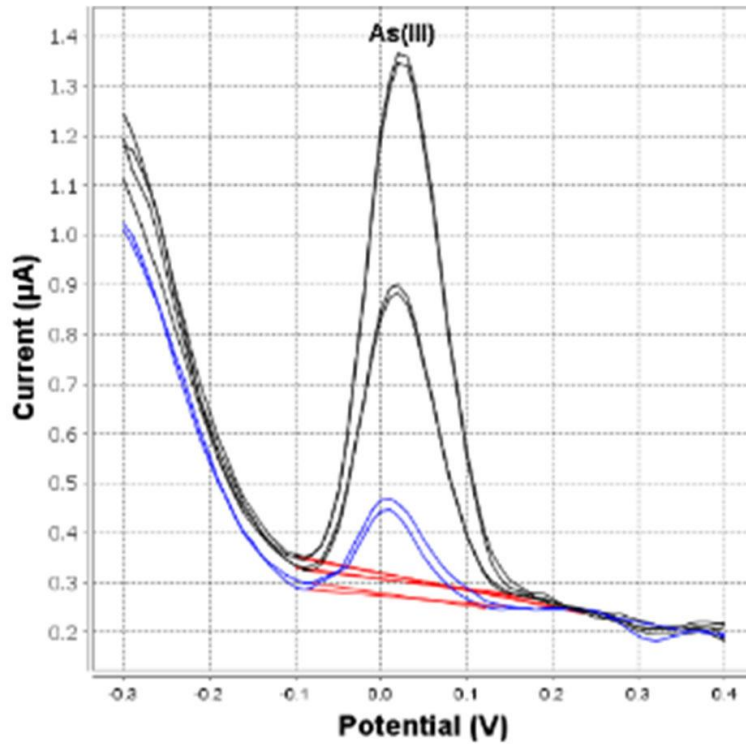


Figure 3. Determination of arsenic in bottled mineral water (946 Portable VA Analyzer; 60 s deposition time)

Table 2. Results of the determination of As(III) in mineral water

Sample	As ($\mu\text{g/L}$)
Bottled mineral water	1.4

REFERENCES

Application Bulletin 416: [Determination of arsenic in water with the scTRACE Gold](#)

CONTACT

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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高端痕量分析的入器。此已的瑞士万通技与高效位/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,保可能的最高精度。

通此器也可使用旋行定,例如借助«循环伏安溶出法»(CVS)、«循环脉冲伏安溶出法»(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。