



Application Note AN-V-229

Antimony(III) in drinking water

Straightforward determination in the low ng/L range on the scTRACE Gold

The toxicity of antimony depends on its oxidation state: antimony(III) is more toxic than antimony(V). Due to its carcinogenicity, EU legislation specifies 5 $\mu\text{g/L}$ and the World Health Organization (WHO) sets a maximum concentration of 20 $\mu\text{g/L}$ as the Sb(III) limit value in drinking water.

Straightforward determination using anodic stripping voltammetry provides a fast (analysis time under 10 minutes) and an ultra-sensitive tool for monitoring the antimony(III) concentration in drinking water. Already with a 30 s deposition time, the limit of detection is

around 0.1 $\mu\text{g/L}$ and can be lowered even further. The linear range ends at ca. 20 $\mu\text{g/L}$. This determination is performed on the scTRACE Gold: a combined sensor containing working, reference, and auxiliary electrodes 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. This method is suited for manual or automated systems.

SAMPLE

Drinking water, mineral water, seawater

EXPERIMENTAL

The water sample and the supporting electrolyte are pipetted into the measuring vessel. The determination of antimony(III) 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 antimony(III) 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	DP – Differential Pulse
Deposition potential	-0.1 V
Deposition time	30 s
Start potential	-0.1 V
End potential	0.2 V
Peak potential Sb(III)	0.06 V

ELECTRODES

- scTRACE Gold

RESULTS

At a 30 s deposition time, this method is suitable for the determination of antimony(III) in water

samples in concentrations from β (Sb(III)) = 0.1–10 $\mu\text{g/L}$.

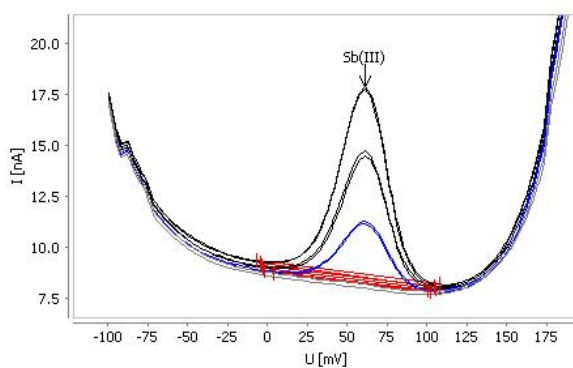


Figure 3. Determination of antimony(III) in tap water spiked with 1 $\mu\text{g/L}$ (30 s deposition time)

Table 2. Result

Sample	Sb(III) ($\mu\text{g/L}$)
Tap water spiked with 1 $\mu\text{g/L}$ Sb(III)	0.94

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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、砷、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。