Application Note AN-V-212

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Straightforward determination by voltammetry using a gold microwire electrode

Mercury and its compounds are toxic. The highest risk is posed by chronic poisoning with mercury compounds ingested with food. A significant part of the mercury present in the environment is of anthropogenic origin. Considerable sources are coal-fired power plants, steel, and nonferrous metal production, waste incineration plants, the chemical industry, or artisanal gold mining where the use of elemental mercury for the extraction of gold from the ore is still common. The guideline value for inorganic mercury in the World Health Organization's «Guidelines Quality» for Drinking-water is set to 6 µg/L.

With a limit of detection (LOD) of 0.5 µg/L, anodic stripping voltammetry is a viable, less sophisticated alternative to atomic absorption spectroscopy (AAS). While AAS (and competing methods) can only be performed in a laboratory, anodic stripping voltammetry can be used conventionally in the laboratory or alternatively in the field with the 946 Portable VA Analyzer. The determination is carried out on the scTRACE Gold electrode.

SAMPLE

Bottled mineral water, spiked

EXPERIMENTAL

The scTRACE Gold is electrochemically activated and an ex situ mercury film is deposited prior to the first determination. In the next step, the water sample and the supporting electrolyte are pipetted into the measuring vessel. The determination 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 standard addition solution.

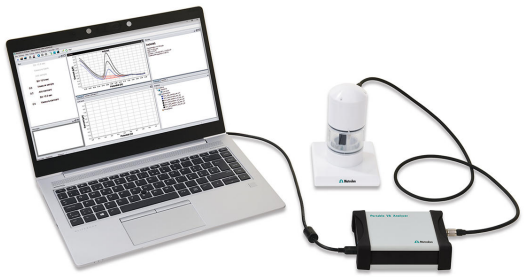

Figure 1. 946 Portable VA Analyzer (scTRACE Gold version)

EXPERIMENTAL

Figure 2. 884 Professional VA fully automated for VA

Table 1. Parameters

Parameter	Setting
Mode	DP-Differential pulse
Deposition potential	0.3 V
Deposition time	90 s
Start potential	0.3 V
End potential	0.6 V
Peak potential As	0.44V

ELECTRODES

- scTRACE Gold

RESULTS

The limit of detection of the method is approximately 0.5 µg/L.

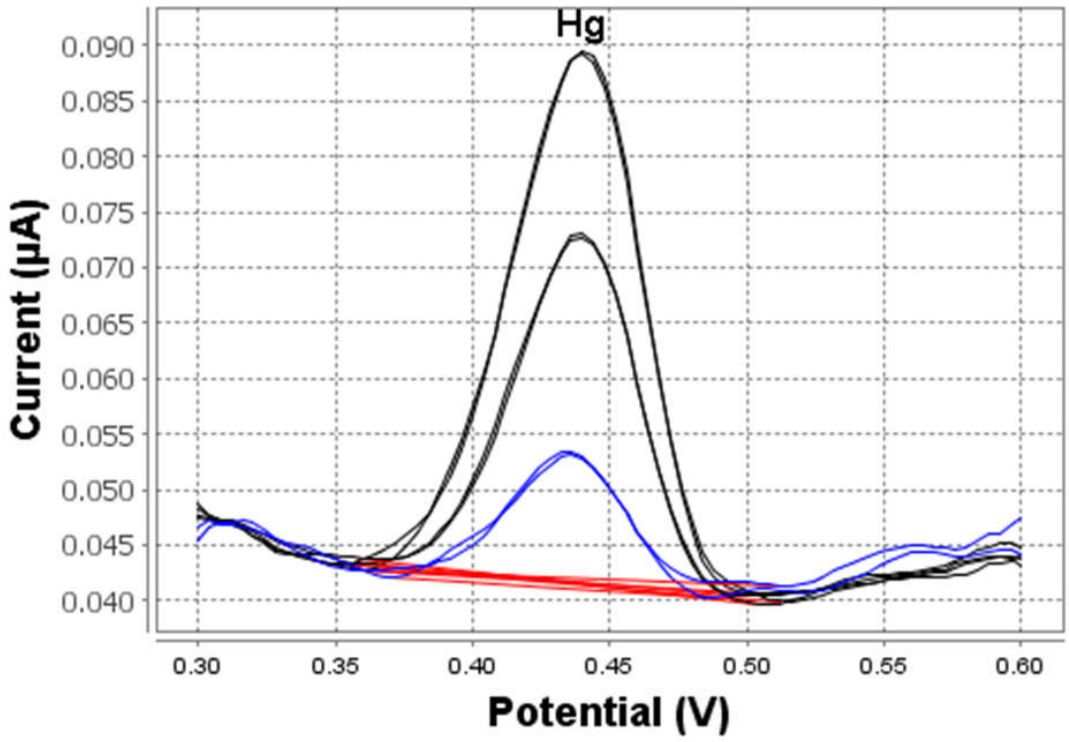

Figure 3. Determination of mercury (946 Portable VA Analyzer; 90 s deposition time)

Table 2. Results of Hg analysis in spiked bottled mineral water

Sample	Hg (µg/L)
Bottled mineral water	2.1

REFERENCES

Application Bulletin 422: Determination of mercury in water with the scTRACE Gold

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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。