



Application Note AN-V-212

Mercury in mineral water

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 $\mu\text{g/L}$.

With a limit of detection (LOD) of 0.5 $\mu\text{g/L}$, 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.

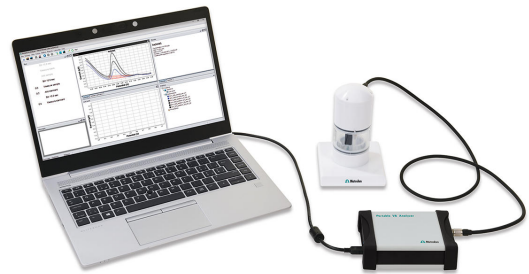


Figure 1. 946 Portable VA Analyzer (scTRACE Gold version)



Figure 2. 884 Professional VA fully automated for VA

Table 1. Parameters

Parameter	Setting
Mode	SQW – Square wave
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.

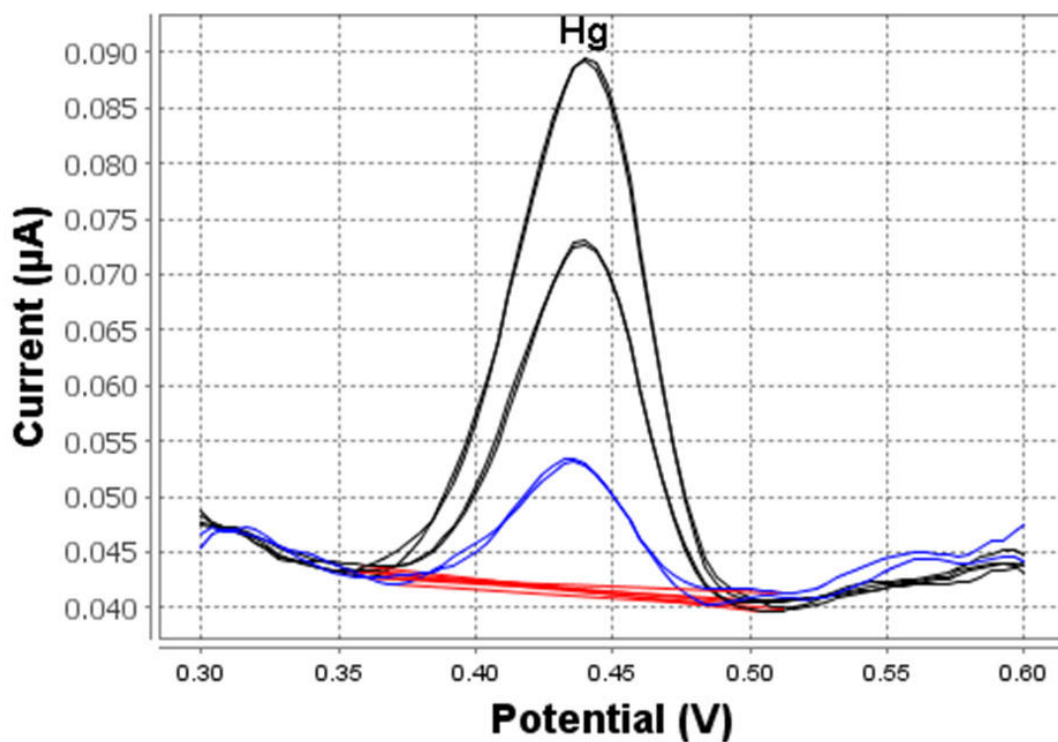


Figure 3. Determination of mercury (946 Portable VA Analyzer; 90 s deposition time)

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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