



Application Note AN-V-215

Zinc in drinking water

Straightforward determination over a wide concentration range with the scTRACE Gold

At zinc concentrations above 3 mg/L, the quality of drinking water deteriorates, and an undesirable astringent taste is detectable. No health-based guideline value is required for zinc as it is an essential trace element for humans. The United States Environmental Protection Agency (US EPA) has set a maximum concentration of 5 mg/L as the limit value of Zn in drinking water.

The anodic stripping voltammetric method with an overall determination time of less than 10 minutes is fast, very sensitive, and can be applied for a wide range of concentrations. Without applying any

deposition time, the limit of detection is around 1 µg/L. This value can be lowered further when the deposition time is increased. When a reductive determination is carried out, the linear range of the method can be extended to 1.5 mg/L. The excellent performance of the method is due to the unique design and architecture of the scTRACE Gold electrode. This sensor does not require extensive maintenance such as mechanical polishing. Measurements can be performed in the laboratory or alternatively in the field. This method is suited for manual and automated systems.

SAMPLE

Drinking water, mineral water

EXPERIMENTAL

The water sample and the supporting electrolyte are pipetted into the measuring vessel. The determination of zinc 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 zinc standard addition solution.

The scTRACE Gold is electrochemically activated prior to the first determination.



Figure 1. 946 Portable VA Analyzer

EXPERIMENTAL



Figure 2. 884 Professional VA fully automated for VA analysis

Table 1. Parameters

| Parameter | Setting |
|-----------------------|---|
| Mode (884) Mode (946) | DP – Differential Pulse SQW – Square wave |
| Start potential | -1.05 V |
| End potential | -0.45 V |
| Peak potential Zn | 0.06 V |

ELECTRODES

- scTRACE Gold

RESULTS

Without deposition time, this method is suitable for the determination of zinc in water samples in

concentrations from $\beta(\text{Zn}) = 1\text{--}50 \mu\text{g/L}$.

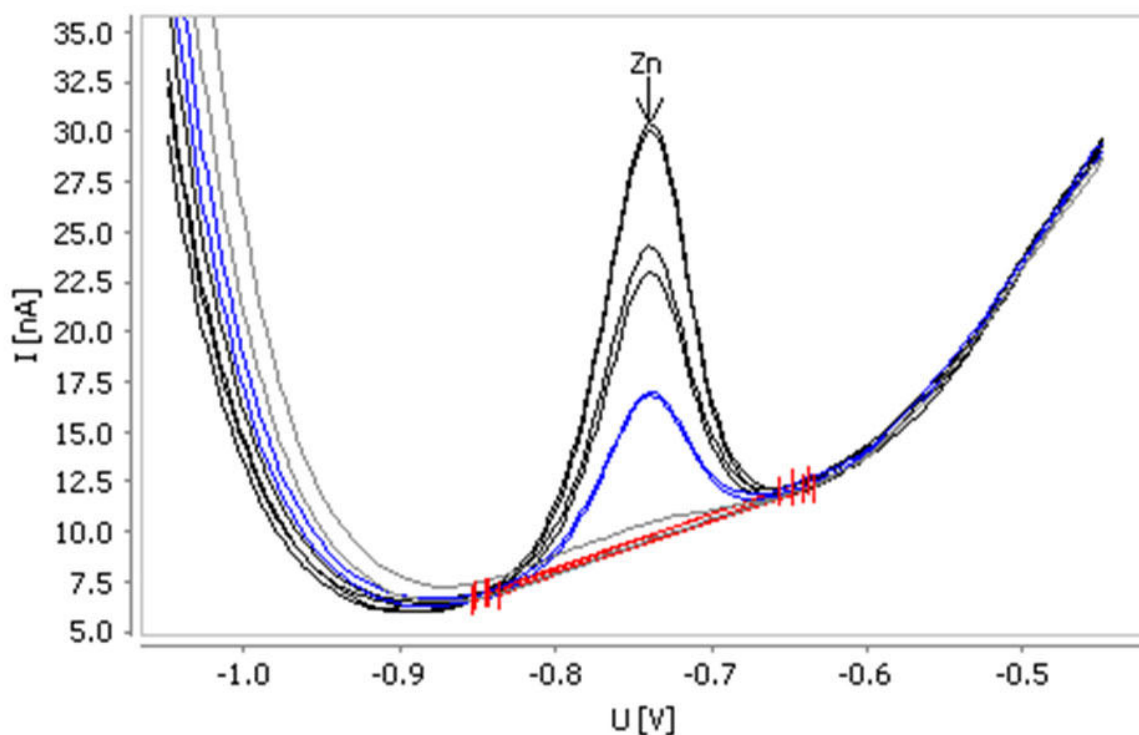


Figure 3. Determination of zinc in mineral water spiked with 10 µg/L (0 s deposition time)

Table 2. Results

| Sample | Zn (µg/L) |
|--------------------------------------|-----------|
| Mineral water spiked with 10 µg/L Zn | 10.8 |

Internal references: AW VA CH4-0573-112018; AW

VA CH4-0575-122018

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