Application Note AN-V-213

Copper in drinking water

Straightforward determination by voltammetry using a gold microwire electrode

Higher levels of copper in drinking water are usually caused by corrosive action of water leaching copper from copper pipes. While copper is an essential nutrient for the human body, ingestion of higher concentrations have an adverse effect on our health. The current World Health Organization's «Guidelines for Drinking-water Quality» recommend a maximum concentration of 2000 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) for the determination of copper in drinking water. 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.

Tap 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 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.

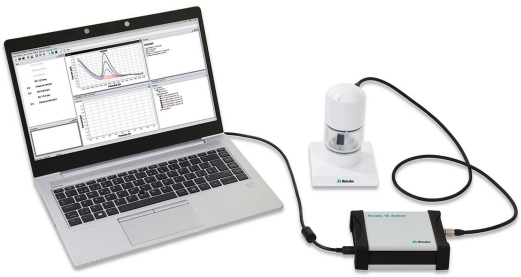

Figure 1. 946 Portable VA Analyzer (scTRACE Gold version)

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	30 s
Start potential	-0.1 V
End potential	0.6 V
Peak potential As	0.25 V

ELECTRODES

- scTRACE Gold

RESULTS

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

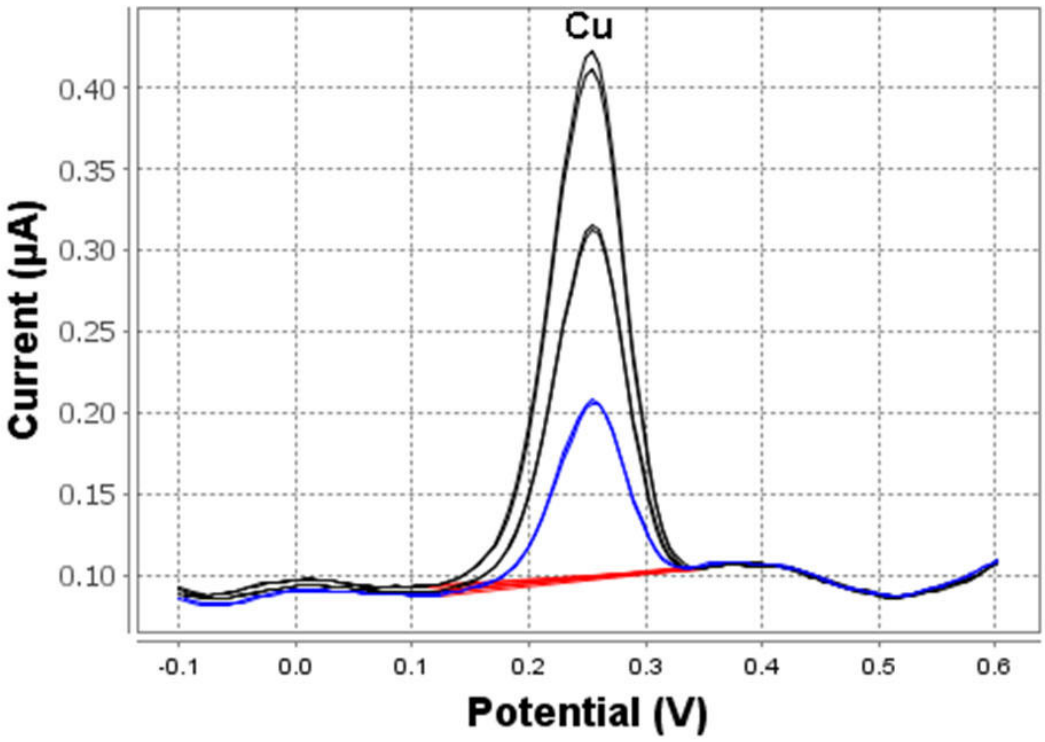

Figure 3. Determination of copper in tap water (946 Portable VA Analyzer; 30 s deposition time)

Table 2. Results of Cu analysis in tap water

Sample	Cu (µg/L)
Bottled mineral water	5.1

REFERENCES

Application Bulletin 429: Determination of copper in water with the scTRACE Gold

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