

NR 1275

Date: 03-apr-07

# Application Data Sheet

## Hardness, Calcium & Magnesium

**Matrix**

Drinking water, Industrial waste water and Surface water.

**Principle**

Calcium and magnesium form a stable complex with EDTA at pH 10. The detection of this potentiometric titration is performed using a Cu-ISE. The Cu-ISE gives only a respond to copper-ions. A buffer solution which contains Cu-EDTA, ammonia and ammoniumchloride should be added. A stable copper-tetra-amine complex is formed, which forms a second complex with EDTA. In presence of another metal-ion the copper-tetra-amine-EDTA complex will lose its form and an EDTA-metal complex is formed. The copper from the copper-tetra-amine-EDTA is released. The released copper-ions are titrated using EDTA.

**Detection method**

Method:	Detector	Ion:	λ:
Ca2+ Titration - Complexometric	ISE	Cu	n.a.

**Specification**

Range	Standard Dev.	Repeatability	Inaccuracy	Analysis time
Ca2+ 8 - 200 mg/l	< 0.2 mg/l	< +/- 0.6 mg/l	< +/- 1.0 mg/l	10 minutes

( If 2 options : whichever is larger )

**Interferences**

All metals.

**Reagents**

pH 10 Cu-EDTA buffer solution                      2 ml per analysis  
 acid solution    2 ml per analysis  
 0.01 M EDTA

**Procedure**

- clean the analysis vessel with DI water
- take 20 ml of sample
- add buffer solution
- perform titration with EDTA
- calculate result
- clean the analysis vessel with DI water and acid solution

**Remarks**

Higher range by dilution of the sample or changing the concentration of the EDTA.

**Possible Analyzer**

- 2040
- 2016
- 2018 HD
- 2019 HD
- 2019 Special
- 2019 Digest
- 2003 Alert
- 2004 Alert

**Typical Wet Part layout**

( Other layouts may be realised in order to meet desired criteria, e.g measuring range. )

