Ti Application Note No. T- 61

Title:	**Traces of calcium in brine by photometric titration**

***Summary*:**	Determination of traces of calcium in brine by photometric titration with 1,2-diaminocyclohexanetetraacetic acid using the 610 nm Spectrode.

Sample:	Brine

Sample Preparation:	none

Instruments and Accessories:	702, 716, 736, 751 or 785 Titrino, 703 Titration Stand, 6.5501.01X Spectrode 610 nm, Metrodata TiNet 2

Analysis:	Pipette 50 mL sample into an Erlenmeyer flask, then add 100 µL w(KOH) = 50%, 150 µL triethanolamine and 0.6 mL hydroxynaphthol blue colour indicator (50 mg / 50 mL ultrapure water). Remove the dissolved gases by applying a vacuum for about 1 min, then titrate with 1,2-diaminocyclohexanetetraacetic acid c(DCTA) = 0.062 mmol/L using the MET mode. Standard addition for linear regression: Repeat the determination with new samples to which 4 µg, 8 µg or 12 µg Ca^{2+} (standard solution) has been added.

Calculation:	a) Direct determination: 1 mL c(DCTA) = 0.062 mmol/L corresponds to 2.48 µg Ca^{2+} µg/L Ca^{2+} = EP1 * C01 * C02 / C00 EP1 = titrant consumption in mL (intersection point TiNet) C00 = 50 (sample volume in mL) C01 = 1000 (conversion factor in mL/L) C02 = 2.48

b) Determination by standard addition (linear regression):
Calculation by means of linear regression is only possible with TiNet 2.

Regression line: $y = a * x + b$

a = slope in mL/µg
b = axis intercept in mL
x = addition of Ca^{2+} (standard) in µg
y = titrant consumption in mL (intersection point TiNet)

µg/L Ca^{2+} = b / a * C01 / C00

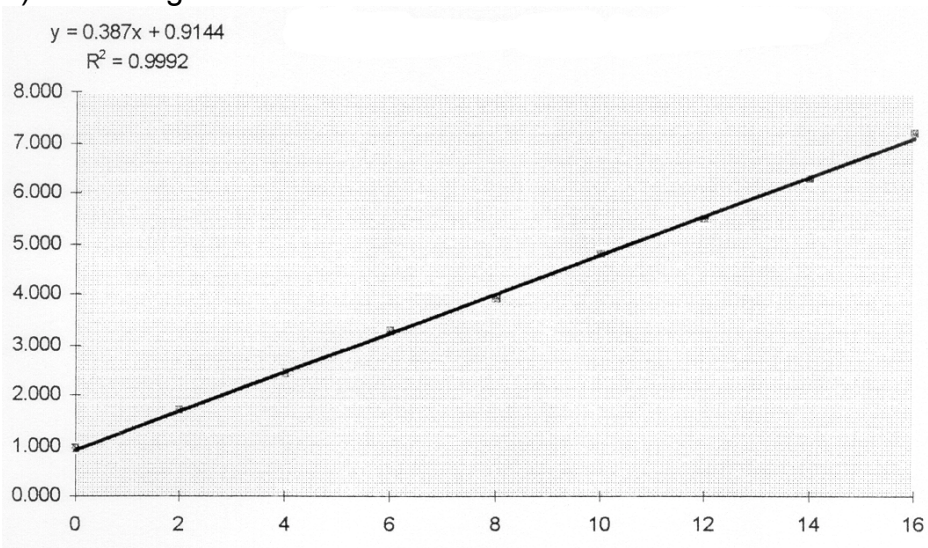
C00 = 50 (sample volume in mL)
C01 = 1000 (conversion factor in mL/L)

Results:

Determination of calcium in 30% KCl brine, prepared from «suprapur» chemicals:

a) EP1 = 0.961 mL ⇒ 47.8 µg/L Ca^{2+}

b) Linear regression



a = 0.387 mL/µg
b = 0.9144 mL ⇒ 47.3 µg/L Ca^{2+}