Ti Application Note No. T- 31

Title:	**Na_2O (free base) and SiO_2 (silicate) in water glass**

***Summary*:**	Determination of Na_2O and SiO_2 in water glass by potentiometric titration with HCl using the Sb electrode.

Sample:	Water glass (solution of Na silicate)

Sample Preparation:	none

Instruments and Accessories:	702, 716 or 736 Titrino or 726 Titroprocessor, 6.0303.000 Sb electrode and 6.0712.100 reference electrode (consists of 6.0724.140 internal system + 6.1227.000 electrolyte vessel)

Analysis:	Weigh exactly ca. 1 g sample into a plastic beaker and dissolve in 50 mL dist. water. Titrate with c(HCl) = 1 mol/L and stop after the first equivalence point (free base). Add 5 mL potassium fluoride solution (400 g/L), wait for 2 min and titrate again with c(HCl) = 1 mol/L (silicate).

Calculation:	% Na_2O = C31 = EP1 * C01 * C02 * C04 / (C00 * C03) excess HCl = C30 = C41 - EP1 EP1 = titrant consumption in mL for the first titration C00 = ca. 1 (sample weight in g) C01 = 1 (concentration of the titrant in mol/L) C02 = 62 (M(Na_2O) in g/mol) C03 = 20 (special factor) C04 = titre of the titrant C41 = titrant consumption in mL at the end of the first titration

Calculation:	% SiO_2 = RS1 = (EP1 + C30) * C01 * C02 * C03 * C04 / C00 Mass ratio = RS1 / C31 Solids = RS1 + C31 EP1 = titrant consumption in mL for the second titration C00 = ca. 1 (sample weight in g) C01 = 1 (concentration of the titrant in mol/L) C02 = 60.1 (M(SiO_2) in g/mol) C03 = 0.025 (special factor) C04 = titre of the titrant C30 = excess HCl in mL from the first titration (Na_2O) C31 = result % Na_2O (first titration)

Remarks:	Polish the surface of the Sb electrode from time to time with wetted Alox powder. **Results:** AVG(6) = 9.53 +/- 0.02 % Na_2O AVG(6) = 30.00 +/- 0.05 % SiO_2 AVG(6) = 39.53 +/- 0.05 % solids AVG(6) = 3.15 +/- 0.01 (mass ratio)