Ti Application Note No. T- 20

Title:	**Cr(VI) and Cr(III) in chromium baths**

***Summary*:**	Determination of Cr(VI) and Cr(III) in chromium baths by iodometric potentiometric titration with thiosulphate using the combined Pt electrode.

Sample:	Chromium baths

Sample Preparation:	For the determination of Cr(VI) no sample preparation is needed. To determine Cr(III) prepare the sample as follows: Pipette 0.20 mL bath sample into a beaker, then add ca. 50 mL dist. water and 0.5 g sodium peroxide. Heat the solution and boil it for ca. 20 ... 30 min. Allow to cool and replace the evaporated dist. water.

Instruments and Accessories:	702, 716 or 736 Titrino or 726 Titroprocessor, 6.0415.100 combined Pt electrode

Analysis:	**Determination of Cr(VI):** Pipette 0.20 mL bath sample into a beaker, then add 50 mL dist. water, 0.2 g ammonium bifluoride, 10 mL conc. HCl and ca. 1 g potassium iodide. Titrate with c($Na_2S_2O_3$) = 0.1 mol/L. **Determination of Cr(III):** Use the prepared sample solution and perform the analysis as described under «Determination of Cr(VI)». In this titration the total chromium content is determined, i.e. the sum of Cr(VI) and Cr(III). The Cr(III) content can then be calculated.

Calculation:	1 mL c($Na_2S_2O_3$) = 0.1 mol/L corresponds to 1.7332 mg Cr(VI). g/L Cr(VI) or Cr total = EP1 * C01 / C00 EP1 = titrant consumption in mL C00 = 0.20 (sample size in mL) C01 = 1.7332 g/L Cr(III) = g/L Cr total - g/L Cr(VI)

Remarks:	If the result is to be given in g/L CrO_3 the determined Cr(VI) content has to be multiplied by 1.923. **Results:** AVG(3) = 141.07 +/- 0.073 g/L Cr(VI) AVG(3) = 4.18 +/- 0.20 g/L Cr(III)