Ti Application Note No. T- 64

Title:	**Titanium and iron in mixtures**

***Summary*:**	Simultaneous determination of titanium and iron by potentiometric titration with potassium dichromate using a platinum electrode. Prior to the determination Ti^{4+} and Fe^{3+} are reduced with Cr^{2+}.

Sample:	Solution containing Ti^{4+} and Fe^{3+}

Sample Preparation:	Pipette a suitable volume of sample solution into a beaker, then add 40 mL acid mixture (containing 75 mL conc. HCl and 168 mL conc. H_2SO_4 per litre). Pass nitrogen through the solution and, while stirring, add about 0.2 g solid $CrCl_2$.

Instruments and Accessories:	702, 716, 736, 751 or 785 Titrino or 726 Titroprocessor, 6.0330.100 Pt electrode, 6.0726.100 Ag/AgCl reference electrode

Analysis:	Pass nitrogen through the solution and titrate with c(1/6 $K_2Cr_2O_7$) = 0.1 mol/L just past the third equivalence point. The first equivalence point of the titration curve corresponds to the Cr^{2+} excess, the second EP corresponds to Ti^{3+} (which is oxidised to Ti^{4+}) and the third EP to Fe^{2+} (which is oxidised to Fe^{3+}).

Calculation:	g/L Ti = (EP2 – EP1) * C01 * C02 / C00 g/L Fe = (EP3 – EP2) * C01 * C03 / C00 EP1 = titrant consumption to reach the first EP in mL EP2 = titrant consumption to reach the second EP in mL EP3 = titrant consumption to reach the third EP in mL C00 = sample volume in mL C01 = 0.1 («normality» of the titrant in mol/L) C02 = 47.88 [M(Ti) in g/mol] C03 = 55.85 [M(Fe) in g/mol]

Results:	AVG(3) = 119.93 ± 0.11 g/L Ti AVG(3) = 53.17 ± 0.17 g/L Fe