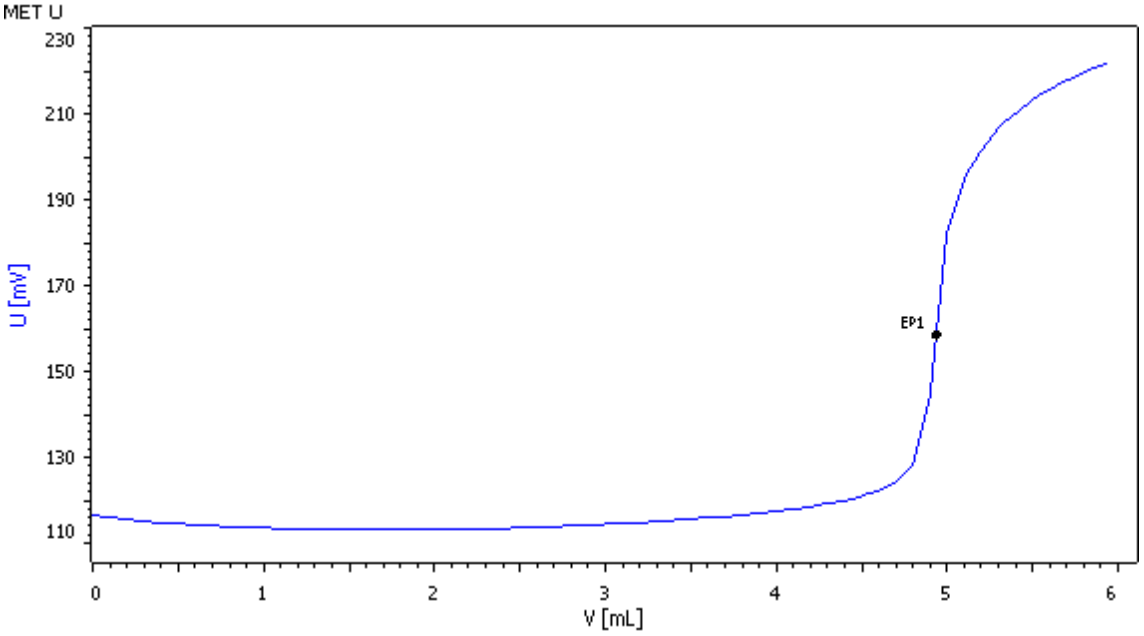
Titration Application Note T–107

Fully automated determination of total iron in cement



This Application Note describes the fully automated complexometric determination of iron in cement (digested) with a copper ion-selective electrode and the MATi 07 system.

Metrohm

Method description

Sample

Cement

Sample preparation

Sample preparation according to DIN EN 196-2

Configuration MATi 07	
Ion-selective electrode, Cu	6.0502.140
LL ISE Reference	6.0750.100

Solutions

Titrant	$c(CuSO_4)$ = 0.1 mol/L in H_2O If possible, this solution should be bought from a supplier
EDTA solution	$c(Na_2EDTA)$ = 0.1 mol/L in H_2O If possible, this solution should be bought from a supplier
Acetate buffer	123 g sodium acetate and 86 mL glacial acetic acid are dissolved in distilled water and filled up to 1 L
Standard	Ammonium ferric(III) sulfate (0.1 mol/L) (Fluka, Titer = 1.000 ± 0.3% (rel.), 20 °C) If possible the standard should be bought from a supplier

Analysis

The sample solution is diluted with approximately 50 mL distilled water in a titration beaker. Buffer solution (5 mL), and an excess (e.g., 10 mL) of EDTA solution are added. The excess of EDTA is back-titrated with $c(CuSO_4)$ = 0.1 mol/L in H_2O.

Parameters

Mode	MET U
Pause	30 s
Stirrer speed	8
Volume. increment	100 µL
Signal drift	50 mV/min
Max. waiting time	26 s
Stop EP	1
EP criterion	5 mV
EP recognition	greatest

Results

Ammonium ferric(III) sulfate (0.1 mol/L) standard

Parameter	Mean in mol/L	RSD (%)	Recovery (%)
Iron(III) 1, 2, 3, 4, 5, 6, 7, 8, 9 mL	0.1006 (n = 9)	0.55	100.6
Iron(III) 9 × 5 mL	0.1012 (n = 9)	0.21	101.2

Sample solution

Parameter	Mean in %	RSD (%)
% Fe_2O_3	2.51 (n = 4)	0.04