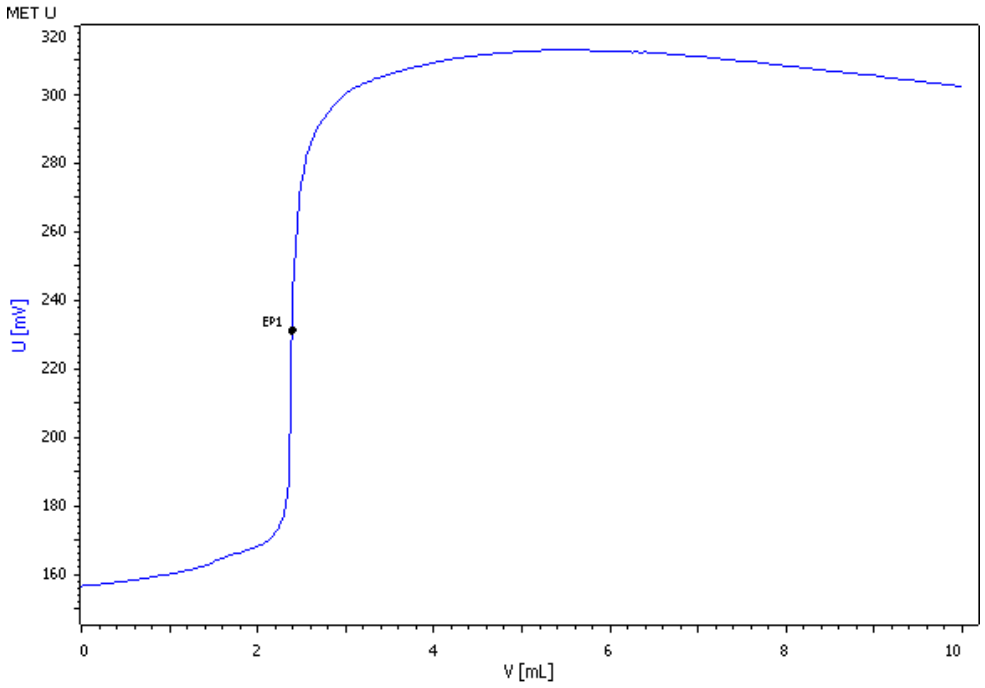
Titration Application Note T-148

Zirconium analysis using automated photometric titration



Zirconium can be determined in acidic aqueous solutions (buffer pH 1) by direct titration with EDTA. Eriochrome cyanine R is used as indicator. For equivalence point indication, the Optrode is used at a wavelength of 520 nm.

Metrohm

Method description

Sample

Aqueous solution of zirconium (0.05 mol/L)

Sample preparation

No sample preparation is required.

Configuration

907 Titrando	2.907.0020
815 Robotic USB Sample Processor XL	2.815.0020
786 Swing head	2.786.0040
Swing arm	6.1462.070
Titration head	6.1458.010
Sample rack 28 x 200 mL	6.2041.830
800 Dosino, 3 x	2.800.0010
802 Stirrer	2.802.0020
5 mL Dosing unit	6.3032.150
10 mL Dosing unit	6.3032.210
50 mL Dosing unit	6.3032.250
Disposable PP sample beaker, 200 mL	6.1459.310
Optrode	6.1115.000

Solutions

EDTA solution	$c(Na_2EDTA)$ = 0.1 mol/L If possible this solution should be bought from a supplier.
Eriochrome cyanine R	40 mg Eriochrome cyanine R is dissolved in 100 mL deion. water.
Buffer pH 1	A buffer concentrate should be bought from a supplier.

Analysis

5 mL sample solution is pipetted into a 200 mL plastic beaker and 90 mL deion. water is added. After the addition of 5 mL buffer pH 1 and 1 mL eriochrome cyanine R indicator solution, the zirconium is titrated with $c(Na_2EDTA)$ = 0.1 mol/L until after the equivalence point.

Parameters

Mode	MET U
Pause	30 s
Stirring rate	8
Signal drift	20 mV/min
Min. waiting time	0 s
Max. waiting time	38 s
Volume increment	0.05 mL
EP criterion	15 mV
EP recognition	Greatest
Stop volume	7.5 mL

Results

Mean results (n = 6)

Zr content / (g/L)	4.323
s(rel) / %	0.87