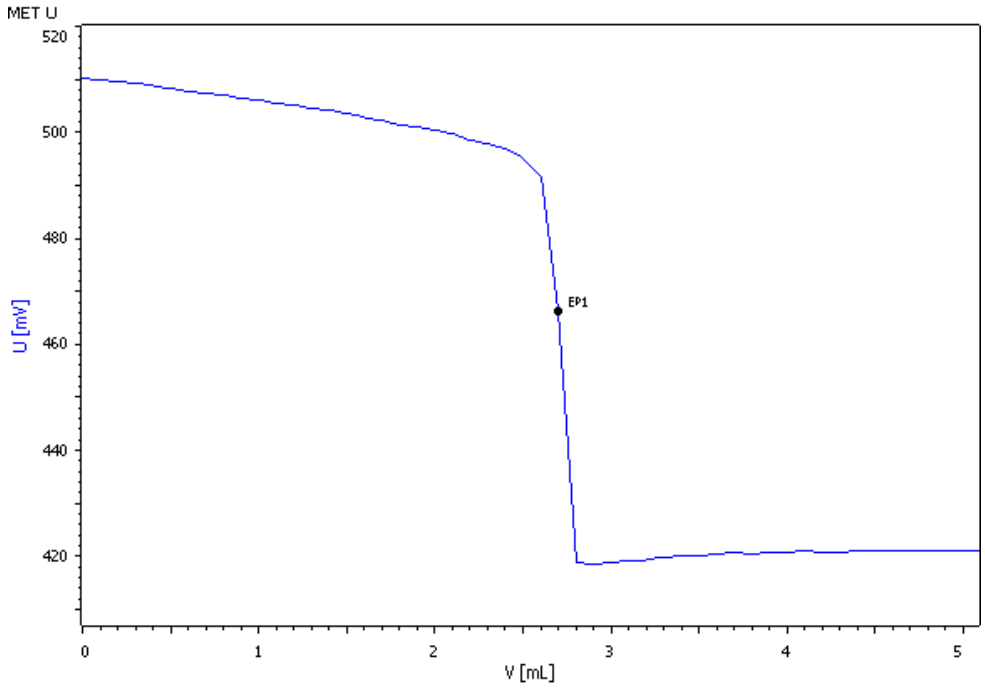
Titration Application Note T–143

Cobalt analysis by automated photometric titration



Cobalt can be analyzed in aqueous solutions by direct titration with EDTA at pH 9. The indicator is murexide, and the equivalence point is determined with the Optrode at a wavelength of 574 nm.

Metrohm

Method description

Sample

Aqueous solution containing cobalt (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.
Murexide	0.2 g murexide (1:100 in NaCl) is dissolved in 50 mL deion. water.

Analysis (Optrode 574 nm)

5.0 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 9 and 5 mL murexide indicator solution the cobalt is titrated with $c(Na_2EDTA) = 0.1$ mol/L until after the endpoint.

Parameters

Mode	MET U
Pause	30 s
Stirring rate	8
Signal drift	50 mV/min
Min. waiting time	5 s
Max. waiting time	26 s
Volume increment	0.1 mL
EP criterion	15 mV
EP recognition	Greatest
Stop volume	10 mL

Results

Mean result (n = 5)

Cd content / (g/L)	3.205
s(rel) / %	1.51