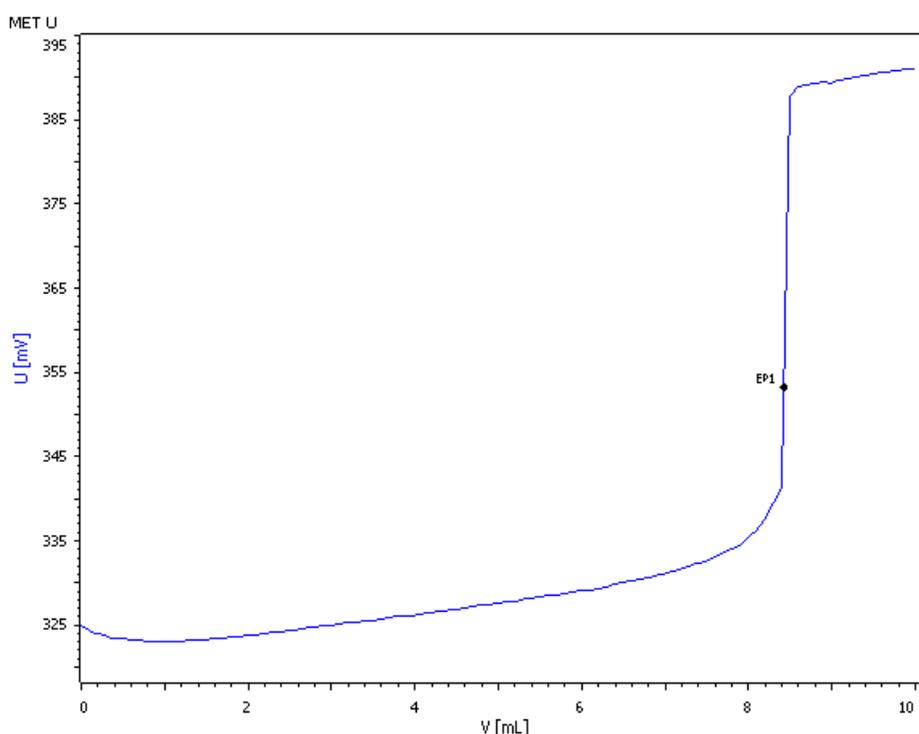


Automated photometric determination of gallium using the Optrode



Gallium is determined at pH 4.7 by back-titration with zinc sulfate. To visualize the equivalence point xylenol orange is used as indicator and the equivalence point is detected with the Optrode at a wavelength of 610 nm.

Method description

Sample

Aqueous solution of gallium

Xylenol orange indicator solution	100 mg xylenol orange is dissolved in 100 mL deion. water
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Sample preparation

No sample preparation is required.

Configuration

907 Titrand	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, 5x	2.800.0010
802 Stirrer	2.802.0020
Stirring propeller	6.1909.020
5 mL Dosing unit	6.3032.150
10 mL Dosing unit, 2x	6.3032.210
20 mL Dosing unit	6.3032.220
50 mL Dosing unit	6.3032.250
Disposable PP sample beaker, 200 mL	6.1459.310

Solutions

Titrand	$c(\text{ZnSO}_4) = 0.1 \text{ mol/L}$ 28.9 g $\text{ZnSO}_4 \cdot 7 \text{ H}_2\text{O}$ is weighed into a 1000 mL volumetric flask and dissolved in approx. 500 mL deion. water. After the addition of 0.5 mL $w(\text{H}_2\text{SO}_4) = 25\%$ the solution is filled up to the mark with deion. water.
EDTA solution	$c(\text{Na}_2\text{EDTA}) = 0.1 \text{ mol/L}$ If possible this solution should be bought from a supplier.
Buffer solution pH = 4.7	116 g ammonium acetate and 86 mL acetic acid are given into a 1L volumetric flask and filled up to the mark with deion. water.

Analysis

10.0–30.0 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 solution pH 4.7, 10.0 mL $c(\text{Na}_2\text{EDTA}) = 0.1 \text{ mol/L}$ and 2 mL xylenol orange indicator solution, the solution is titrated with $c(\text{ZnSO}_4) = 0.1 \text{ mol/L}$ until after the equivalence point.

Parameters

Mode	MET U
Stirring rate	8
Pause	60 s
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 results (n = 3)

Ga content / (g/L)	0.61
s(rel) / %	0.51

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