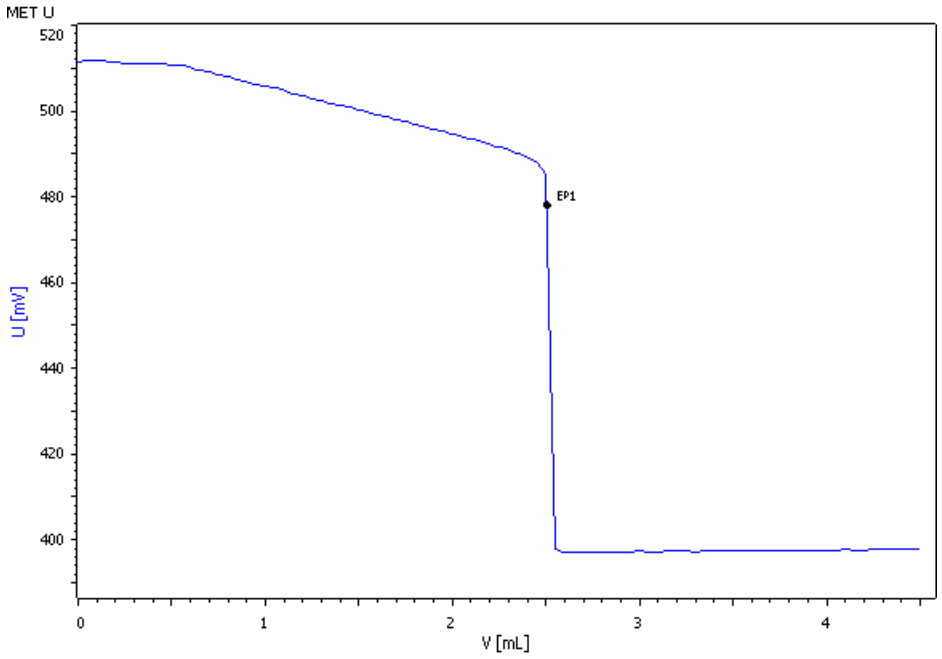
Titration Application Note T-150

# Nickel determination using automated photometric titration




Nickel can be determined in alkaline media. To visualize the endpoint, murexide is used as indicator. The equivalence point is detected with the Optrode at a wavelength of 574 nm.

Metrohm

# Method description

### Sample

Aqueous solution of nickel (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, 4 x | 2.800.0010 |
| 802 Stirrer | 2.802.0020 |
| 5 mL Dosing unit | 6.3032.150 |
| 10 mL Dosing unit, 2 x | 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<br>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 |
| Buffer pH 10 | 54 g $NH_4Cl$ and 300 mL $w(NH_3) = 25\%$ is given into a 1000 mL volumetric flask and filled up to the mark with deion. water. |

### 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 10 and 5 mL murexide indicator solution the nickel is titrated with $c(Na_2EDTA) = 0.1$ mol/L until after the equivalence point.

### Parameters

| | |
|---|---|
| Mode | MET U |
| 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 | 10 mL |
| Mode | MET U |

### Results

Mean results (n = 6)

| | |
|---|---|
| Ni content / (g/L) | 2.95 |
| s(rel) / % | 0.36 |