

Quantitation of Nickel

<u>Chemicals</u>	<u>Material</u>
<ul style="list-style-type: none">• EDTA-disodium salt-dihydrate (EDTA = ethylenediamine tetraacetic acid)• Ammonia-solution w=25%• Ammonium chloride• Murexide-sodium chloride-trituration 1:200• Eriochrome black T-trituration• Zinc sulphate-heptahydrate• Water, dist.	<ul style="list-style-type: none">• Measuring flask• Volumetric pipette• Measuring pipette• Erlenmeyer flask• Funnel• Spatula• Measuring cylinder• Burette• Pipetting aid• Spray bottle• Precision balance• Analysis balance

Safety tips



- wear protection goggles



- wear adequate safety gloves

<p><u>Ammonia 25%:</u></p> <ul style="list-style-type: none">• H314, H335, H400• P280, P273, P301+P330+P331, P305+P351+P338, P309+P310• HAZARD!!	<p><u>Ammonia chloride:</u></p> <ul style="list-style-type: none">• H302, H319• P280, P301+P312, P305+P351+P338• HAZARD!!
<p><u>Zinc sulphate-heptahydrate</u></p> <ul style="list-style-type: none">• H302, H318, H410• P280, P273, P305+P351+P338, P309+P310• HAZARD!!•	<p><u>Nickel sulphate-hexahydrate</u></p> <ul style="list-style-type: none">• H350i, H341, H360D, H372, H302+H332, H315, H334, H317, H410• P201, P281, P285, P273, P302+P352, P304+P340, P309+P311• HAZARD!!

Experimental procedure

- Fill up the given nickel solution in a measuring flask and mix
- Use 1/5 of the solution for titration

Standard solution

- The standard solution $c(\text{EDTA})=0.05 \text{ mol/L}$ is to be prepared oneself and if necessary to be checked with zinc sulphate-heptahydrate solution and eriochrome black T as an indicator
- Therefore add ammonia chloride to the zinc containing solution and adjust the ammonia solution at $\text{pH}=10$

Quantitation of nickel:

- Pipette the aliquote part in a 300 mL-Erlenmeyer flask and dilute with water up to approx. 100 mL
- Add 0.5 g ammonium chloride and 2 mL ammonia solution
- After adding the indicator trituration murexid-sodium chloride 1:200 titrate to the change of color

Waste disposal:

- Dispose of all wastes in the container for basic solutions

Analysis:

- Calculation of the mass of zinc in mg of the given sample

Preparation list

Chemicals:

- EDTA-disodium salt-dihydrate 10 g
- Ammonia-solution w=25% 30 mL
- Ammonia chloride 10 g
- Murexide-sodium chloride-trituration 1:200 0.5 g
- Nickel sulphate-hexahydrate for the standard solution
- Water, dist.

For the standardisation:

- Eriochrome black T-trituration
- Zinc sulphate-heptahydrate 1 g

Material:

- Measuring flask
- Volumetric pipette
- Measuring pipette
- Erlenmeyer flask
- Funnel
- Spatula
- Measuring cylinder
- Burette
- Pipetting aid
- Spray bottle
- Precision balance
- Analysis balance

Preparation of the standard solution:

- Each examinee is to be given 27-30 mL
- Solve 56.0 g nickel sulphate-hexahydrate (=12.5g Ni) in water and fill up to 1000mL
- 2.94 mg Ni=1.00 mL standard solution $c(\text{EDTA})=0.05 \text{ mol/L}$