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Quality goals
Fitness for purpose

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Calcium

- Limitation of std in German drinking water PT: 4% – 10%
- Working Group of the German Federal States on water issues - quality goal for repeatability std: 2% (VC_R→about 4%)
- Reproducibility std in interlaboratory tests:
  - ISO 7980 – AAS: 3,5% - 4,6%
  - ISO 11885 - ICP-OES: 6,1%
  - E34 - ISO 14911 - IC: 3,8 - 8,5%
  - SM 3111 - Flame AAS: 4,2%
  - SM 3120 - ICP-OES: 12,3%
  - SM 3500 Ca-Titrimetry: 9,2%
  - AQS-BW 4/02: 2,8% - 4,6%

Magnesium

- Limitation of std in German drinking water PT: 4% – 10%
- Working Group of the German Federal States on water issues - quality goal for repeatability std: 2% (VC_R→about 4%)
- Reproducibility std in interlaboratory tests:
  - ISO 7980 - AAS: 2,9% - 6,9%
  - ISO 11885 - ICP-OES: 3,1%
  - ISO 14911 - IC: 5,4 - 8,0%
  - SM 3111 - Flame AAS: 10,5%
  - SM 3120 - ICP-OES: 6,1%
  - AQS-BW 4/02: 2,8% - 7,0%

Sodium

- EU drinking water directive:
  - accepted bias 10% at 200 mg/l (VC_R→about 5%)
- Limitation of std in German drinking water PT: 5% – 10%
- Working Group of the German Federal States on water issues - quality goal for repeatability std: 3% (VC_R→about 6%)
- Reproducibility std in interlaboratory tests:
  - DIN 38406-14 - AAS: 3,5 - 3,8 %
  - ISO 11885 - ICP-OES: 5,7%
  - ISO 14911 - IC: 4,8 - 13,4%
  - SM 3111 - Flame AAS: 4,5%
  - SM 3120 - ICP-OES: 21,0%
  - SM 3500-Na Flame Emission: 17,3%
  - AQS-BW 4/02: 3,5% - 7,4%

Potassium

- Limitation of std in German drinking water PT: 5% – 12%
- Working Group of the German Federal States on water issues - quality goal for repeatability std: 4% (VC_R→about 8%)
- Reproducibility std in interlaboratory tests:
  - DIN 38406-13 - AAS: 3,6 - 5,9%
  - ISO 14911 - IC: 4,3 - 17,0%
  - SM 3120 - ICP-OES: 9,3%
  - SM 3500-K Flame photom.: 15,5%
  - AQS-BW 4/02: 4,9 - 11,8%

Iron

- EU drinking water directive:
  - accepted bias 10% at 200 µg/l (VC_R→about 5%)
- Limitation of std in German drinking water PT: 5% – 12%
- Working Group of the German Federal States on water issues - quality goal for repeatability std: 3% (VC_R→about 6%)
- Reproducibility std in interlaboratory tests:
  - DIN38406-1 - Photom.: 2,5%(1 mg/l), 6,3%(0,5mg/l), 13,4%(0,1mg/l), 24,4%(0,05 mg/l)
  - ISO 11885 - ICP-OES: 6,8%
  - DIN 38406-32 - AAS: 8,8% - 18,1%
  - SM 3111 - Flame AAS: 5,8% - 16,5%
  - SM 3120 - ICP-OES: 6,8%
  - SM 3500-Fe Photom.: 25,5% (0,3mg/l)
  - AQS-BW 4/02: 5,7% - 12,8%

Manganese

- EU drinking water directive:
  - accepted bias 10% at 50 µg/l (VC_R→about 5%)
- Limitation of std in German drinking water PT: 5% – 15%
- Working Group of the German Federal States on water issues - quality goal for repeatability std: 4% (VC_R→about 8%)
- Reproducibility std in interlaboratory tests:
  - DIN 38406-2 - Photom.: 4,8%(2 mg/l), 5,9%(1mg/l), 23,5%(0,5mg/l), 28,2%(0,1 mg/l)
  - ISO 11885 - ICP-OES: 2,7%
  - DIN 38406-33 - AAS: 7,1% - 15,2%
  - SM 3111 - Flame AAS: 7,8% - 13,5%
  - SM 3120 - ICP-OES: 3,2%
  - AQS-BW 4/02: 4,9% - 12,2%

Aluminium

- EU drinking water directive:
  - accepted bias 10% at 200 µg/l (VC_R→about 5%)
- Limitation of std in German drinking water PT: 10% – 30%
- Working Group of the German Federal States on water issues - quality goal for repeatability std: 6% (VC_R→about 4%)
- Reproducibility std in interlaboratory tests:
  - ISO 12020 - AAS: 1,0(47µg/l) - 1,6 %(10µg/l)
  - ISO 10566 - Photom. (Brenzcatechinviolett): 19,5%(8µg/l), 8,6%(30µg/l), 6,9%(140µg/l), 2,9%(1mg/l)
  - SM 3111 - Flame AAS: 4,2%
  - SM 3120 - ICP-OES: 5,6%
  - SM 3500-Al Eriochrome Cyanin: 28,8% - 34,4%
  - AQS-BW 4/02: 11,1% - 28,1%

Sulphate

- EU drinking water directive:
  - accepted bias 10% at 250 mg/l ($VC_R \rightarrow$about 5%)
- Working Group of the German Federal States on water issues - quality goal for repeatability std: 2% ($VC_R \rightarrow$about 4%)
- Reproducibility std in interlaboratory tests:
  - ISO 10304-1 - IC: 4,2% - 7,6%
  - SM 4110C IC: 15%
  - SM 4500-SO_4^{2-} - Gravimetrye: 4,7% (260mg/l)
  - SM 4500-SO_4^{2-} - Turbidimetry: 1,7%(7,5mg/l)
  - AQS-BW 4/02: 2,3% - 4,7%

Chloride

- EU drinking water directive:
  - accepted bias 10% 250 mg/l ($VC_R \rightarrow$about 5%)
- Limitation of std in German drinking water PT: 3% – 9%
- Working Group of the German Federal States on water issues - quality goal for repeatability std: 3% ($VC_R \rightarrow$about 6%)
- Reproducibility std in interlaboratory tests:
  - DIN 38405-1 - Mohr: 1,2% - 4,5%
  - ISO 10304-1 - IC: 4,8% - 7,5%
  - SM 4110C IC: 11,9%
  - SM 4500-Cl^- - Mohr: 4,2%
  - AQS-BW 4/02: 1,9% - 5,0%

Fluoride

- EU drinking water directive:
  - accepted bias 10% at 1,5 mg/l ($VC_R \rightarrow$about 5%)
- Limitation of std in German drinking water PT: 5% – 12%
- Working Group of the German Federal States on water issues - quality goal for repeatability std: 5% ($VC_R \rightarrow$about 10%)
- Reproducibility std in interlaboratory tests:
  - ISO 10304-1 - IC: 6,7% - 9,1%
  - DIN 38405-4 - ISE: 2,5% - 7,4%
  - SM 4500-F^- - SPE: 2,9%
  - SM 4500-F^- - SPADNS: 2,8% - 17,2%
  - AQS-BW 4/02: 4,9 - 10,7%

Nitrate

- EU drinking water directive:
  - accepted bias 10% at 50 mg/l ($VC_R \rightarrow$about 5%)
- Limitation of std in German drinking water PT: 4% – 10%
- Working Group of the German Federal States on water issues - quality goal for repeatability std: 4% ($VC_R \rightarrow$about 8%)
- Reproducibility std in interlaboratory tests:
  - ISO 10304-1 - IC: 5,1% - 19,0%
  - ISO 7890 - Photom. (Sulfosalicylic acid): 1,6% - 10,9%
  - SM 4110C IC: 23,7%
  - AQS-BW 4/02: 2,5% - 7,6%