



# Metal speciation analysis

## WHY SPECIATION?

The toxicity, bioavailability and mobility of an element can be highly dependent on the form in which it is present. Consequently, speciation analysis can provide valuable additional information and insight compared to a traditional measurement of the total elemental concentration. Over the last few years, new legislation and guidelines have been published that introduce threshold values for organotin compounds, inorganic arsenic and methylmercury.

## Speciation Analysis

To meet these growing demands, the ALS Scandinavia laboratory in Luleå has implemented a range of speciation analysis packages utilizing GC-ICP-MS and IC-ICP-MS. Our laboratory has now over a decade of experience in speciation analyses and can provide the services outlined below.

## Testing capabilities

### Arsenic (LOQ as As in parentheses)

- Fresh and drinking waters: arsenite (0.1 µg/l); arsenate (0.1 µg/l); dimethylarsinate, DMA (0.1 µg/l); monomethylarsonate, MMA (0.2 µg/l); ISO/TS 19620 using IC-ICP-MS.
- Sea and brackish waters: arsenite (1 µg/l); arsenate (1 µg/l); DMA (1 µg/l); MMA (2 µg/l); ISO/TS 19620 using IC-ICP-MS.
- Feed, foodstuff: inorganic arsenic (0.01 mg/kg); DMA (0.01 mg/kg); MMA (0.02 mg/kg); ISO 16802 using IC-ICP-MS (accreditation underway).
- Urine: arsenite (1 µg/l); arsenate (1 µg/l); DMA (1 µg/l); MMA (2 µg/l); ISO/TS 19620 using IC-ICP-MS.

### Methylmercury (LOQ as Hg in parentheses)

- Soil, sediment, sludge, solid waste: methylmercury, MeHg (0.00005 mg/kg); isotope dilution GC-ICP-MS (accredited).
- Natural waters: MeHg (0.00003 µg/l); isotope dilution GC-ICP-MS (accredited).
- Feed, foodstuff: MeHg (0.0002 mg/kg); isotope dilution GC-ICP-MS (accredited).
- Blood, serum, plasma: MeHg (0.03 µg/l); isotope dilution GC-ICP-MS (validated).

### Organotin compounds (LOQ as organotin cation in parentheses)

- Soil, sediment, sludge, solid waste: MBT, monobutyltin; DBT, dibutyltin; TBT, tributyltin; TTBT, tetrabutyltin; MPHT, monophenyltin; DPHT, diphenyltin; TPHT, triphenyltin; MOT, mono-octyltin; DOT, dioctyltin; TCyT, tricyclohexyltin (0.001 mg/kg for all species); ISO 23161 using GC-ICP-MS (accredited).
- Soil, sediment, sludge, solid waste with low LOQ for TBT: TBT (0.0002 mg/kg); ISO 23161 using GC-ICP-MS (accredited).
- Natural waters: MBT; DBT; TBT; TTBT; MPHT; DPHT; TPHT; MOT; DOT; TCyT (0.001 µg/l for all species); ISO 17353 using GC-ICP-MS (accredited).
- Natural waters with low LOQ for TBT: TBT (0.0002 µg/l); ISO 17353 using GC-ICP-MS (accredited).
- Natural waters with ultra-low LOQ for TBT: TBT (0.00004 µg/l); ISO 17353 using GC-ICP-MS (accredited).

### Selenium (LOQ as Se in parentheses)

- Fresh and drinking waters: selenite (10 µg/l); selenate (50 µg/l); in-house method using IC-ICP-MS.
- Soil, sediment, sludge, solid waste: selenite (0.05 mg/kg); selenate (0.3 mg/kg); in-house method using IC-ICP-MS.
- Feed, foodstuff: selenite (0.05 mg/kg); selenate (0.3 mg/kg); in-house method using IC-ICP-MS.



**Douglas Baxter**  
E-mail: [douglas.baxter@alsglobal.com](mailto:douglas.baxter@alsglobal.com)

**ALS Scandinavia AB**  
Aurorum 10  
SE-977 75 Luleå, Sweden

phone: +46 920 28 99 00  
e-mail: [info.lu@alsglobal.com](mailto:info.lu@alsglobal.com)

[www.alsglobal.se](http://www.alsglobal.se)

version 20-06-2017