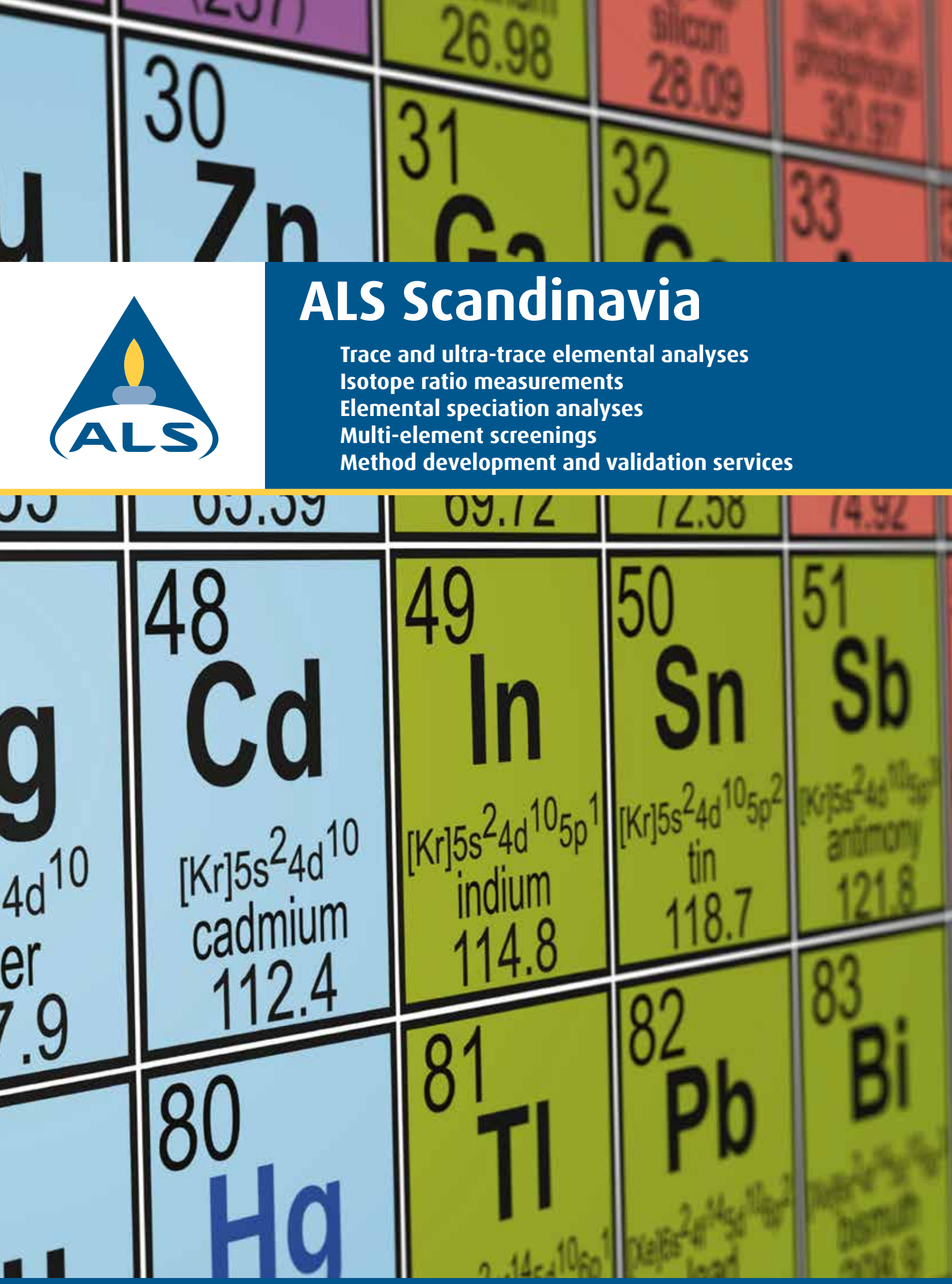

ALS Scandinavia

Trace and ultra-trace elemental analyses
Isotope ratio measurements
Elemental speciation analyses
Multi-element screenings
Method development and validation services

ALS Scandinavia is a part of ALS Group, one of the world's largest actors within chemical laboratory analysis. ALS consists of over 300 laboratories with over 13 000 employees in more than 50 countries.

ALS Scandinavia has many years of experience in collaborating with research institutions, hospitals, pharmaceutical companies, governmental bodies and different manufacturing industries. These collaborations include laboratory analyses, method development projects and client specific method validations. Combined with a strong focus on research, this has resulted in over 100 scientific publications and conference papers being published based on work at our laboratory in Luleå, Sweden.

Trace and ultra-trace elemental analyses

The quantification of elements at ultra-trace concentrations sets extreme demands, not only on instrumentation, but also of the executing laboratory. We currently operate 14 high-resolution ICP-MS (ICP-SFMS) instruments. Not only does this assure a solid backup capacity; by assigning our instruments to specific sample types we minimize risks for inter-sample contamination. ALS Scandinavia's laboratory in Luleå, Sweden, has been specially designed for trace and ultra-trace elemental analyses for a wide range of applications. Numerous measures have been taken to fulfill these demands, some of the most important being presented here:

- The possibility to separate work with sample types, from uncorking to complete analysis.
- Candidate building materials for flooring, ceiling and wall surfaces have been analyzed with respect to elemental composition.
- All incoming air in the clean room laboratory is filtered through HEPA filters.
- The ventilation system is designed to minimize the residence time of particles in indoor air and thus limit fall-out in the laboratory environment.
- All materials coming in contact with samples are analyzed in-house to ensure that potential sources of contamination are avoided.
- High purity nitric acid for sample digestion and acidification of solutions is prepared by sub-boiling distillation in quartz stills.

Isotope ratio analyses

The isotopic composition of an element can be used as a fingerprint providing information on the processes that the element has undergone. This is possible because isotopic compositions are naturally varying and are affected by numerous variables such as the element source or the geological age of a material.
ALS Scandinavia offers isotope ratio measurements by both ICP-SFMS and MC-ICP-SFMS, the latter made possible through our longstanding collaboration with the Luleå University of Technology.
Isotope analyses can be used in a variety of fields including:

- Pollution- and exposure source tracing
- Archaeology
- Enrichment control in the nuclear industry
- Geology and geochronology
- Biochemistry

Element speciation analyses

By coupling our ICP-SFMS technique with GC and HPLC instruments, we are able to complement analyses of total As, Hg, Se and Sn with for example:

- Arsenic speciation: As (III), As (V), DMA & MMA
- Organotin compounds (OTC)
- Methylmercury
- Selenium speciation: Se (IV) & Se (VI)

Why choose ALS Scandinavia?

Our aim is to be the natural first choice when there is need for high quality analyses to the right price. We want to provide the best possible service for the project at hand and no task is too challenging.

- Reporting levels few laboratories in the world can match! Made possible by combining state-of-the-art instrumentation with our custom built facility
- Short turn-around-times! Both standard methods and isotope ratio measurements can be processed in down to 24 hours.
- Solid backup capacity! Operating 14 HR-ICP-MS, 3 AFS, 3 ICP-OES and 2 MC-ICP-MS instruments makes ALS Scandinavia a reliable partner.

Pharmaceuticals

- Analytical solutions for elemental impurities: ICH Q3D and USP <232> & <233>
- Method development and validation services
- GMP certificate
- Over 120 methods validated for the pharmaceutical industry

Clinical samples

- Accredited analyses of 67 elements in blood, serum, plasma and urine
- GLP statement of compliance
- Methylmercury and inorganic arsenic species
- More than 20 scientific articles published on trace element analyses of clinical samples

Chemicals

- Analyses of high purity chemicals and finished products
- Screenings of up to 72 elements
- Routine measurements at ng/L (ppq) levels
- Method development for application in all stages of ultrapure chemical manufacturing

Research

- Over 100 scientific papers published based on work at ALS Scandinavia
- Short turnaround times
- Tailor-made analytical solutions
- Advice and input related to our fields of expertise through the whole project at hand

The Luleå laboratory – Past and present

ICP-based techniques have been the core technology of the Luleå laboratory since **1984** when the first ICP-OES arrived. In **1986** an ICP-QMS was acquired, the first in Scandinavia. This marked the growing need for lower limits of detection demanded by environmental legislation and customer requests, while maintaining the elemental coverage and extensive calibration range of ICP-OES. However, ICP-QMS has its limitations since certain atomic ions such as 75As+, may be interfered by polyatomic species, like 40Ar35Cl+, having the same nominal mass. Such interferences can be resolved instrumentally using ICP-SFMS.

In **1996** the Luleå site became the first commercial laboratory in the world to invest in this technique and offer its benefits to our customers. The current laboratory was built in **2002** and in **2003**, our first multi-collector ICP-SFMS was installed, followed by a second in **2013**. This technique enables high precision isotope ratio measurements at low concentration levels and thus also small sample amounts.

Today, the instrumental park at ALS houses the following instruments:

- 14 ICP-SFMS (inductively coupled plasma – sector field mass spectrometers)
- 2 MC-ICP-SFMS (multi-collector ICP-SFMS)
- 3 ICP-OES (inductively coupled plasma – optical emission spectrometers)
- 3 AFS instruments. (atomic fluorescence spectrometers)

Quality at the laboratory

- ISO 17025 accreditation
- GMP certificate
- GLP statement of compliance
- Frequently audited by the pharmaceutical industry
- About 50 accredited methods
- Over 100 client-specific validated methods

Please contact us!

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Right Solutions • Right Partner