

## TraceCERT: Traceable Certified Reference Materials for Ion Chromatography

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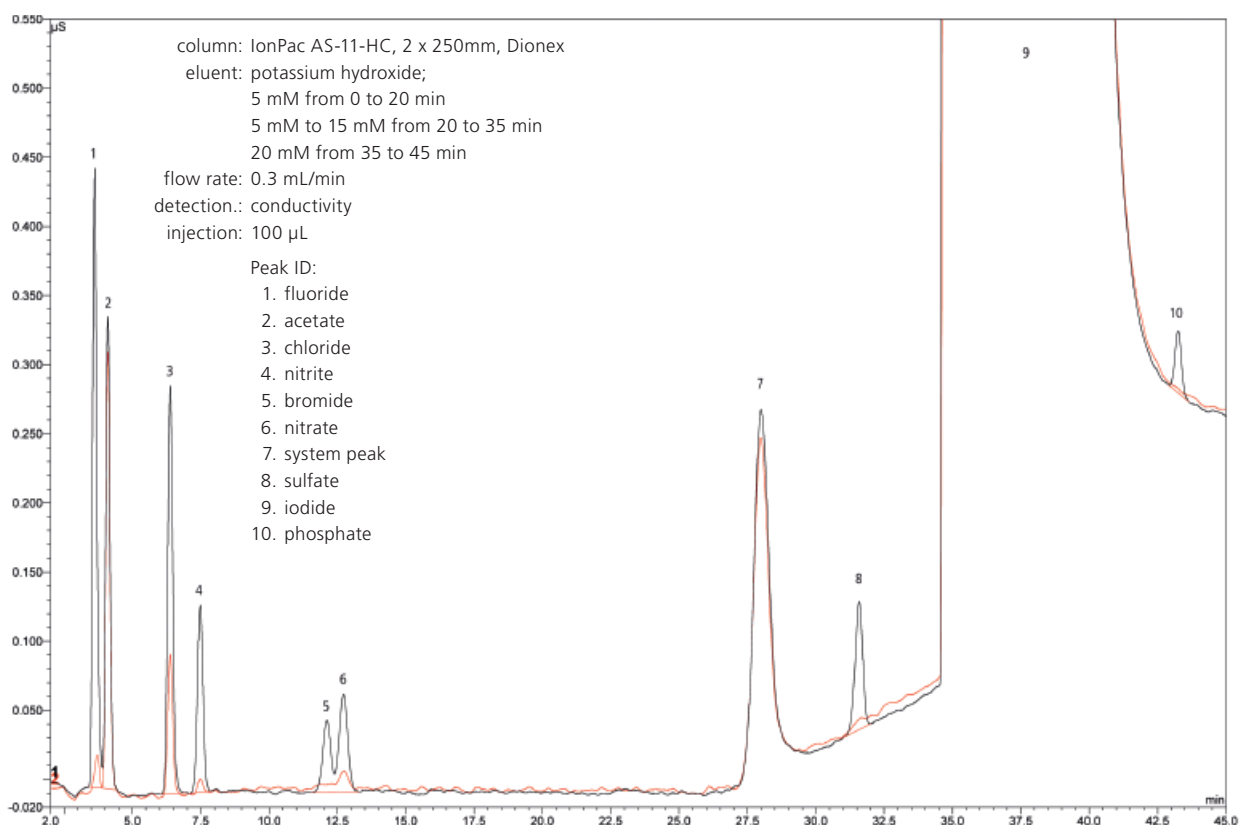
Ion chromatography (IC) is an analytical technique that is used to separate and quantify from percent to ppm-levels of common anions and cations in aqueous samples. Separation occurs via differential interaction with an ion-exchange resin.

Conductivity is the most common detection method and in some cases UV detection is also used. The sensitivity of IC makes it also ideal for low-ppm level quantification or trace analysis. Subsequently, IC requires high-purity eluents and well-defined certified reference materials (CRM).

Because measurement results are directly affected by the quality of the CRM, the choice of the appropriate CRM producer is a matter of trust. One indicator of the technical and administrative competence of a CRM producer is inspection and accreditation by an independent authority. The Sigma-Aldrich production facility in

Switzerland is accredited as a reference material producer by the Swiss Accreditation Service according to ISO Guide 34 and also under ISO/IEC 17025 (1, 2). This double accreditation is called the "Gold Standard" for CRM producers and represents the highest achievable level of quality assurance.

With the first products developed under these double accredited conditions Sigma-Aldrich launches its **TraceCERT**<sup>®</sup> calibration standards program for IC and also for spectrometry. **TraceCERT** stands for Traceability and Certified representing that these CRM are suitable for even the most challenging applications, and also fulfill the needs of laboratories working in a regulated environment. These CRMs are not only traceable to an accepted reference, but are also of well-defined purity and have a properly calculated measurement uncertainty. All details are described in a comprehensive certificate that is designed according to ISO Guide 31 (3). The certificate is available electronically from our web page by entering the product number and corresponding lot number. As a unique feature for these IC standards, we list the most common trace impurities that are relevant for the ion chromatographic separation



**Figure 1** In **TraceCERT**<sup>®</sup> standards the trace impurities relevant for IC are stated in the certificate. The red line is the anion chromatogram of a iodide standard (diluted to 200 mg/kg). The black line is a sample with an addition of anion mixture (10 µg/kg each).

(13 elements for cation standards and 7 inorganic anions for anion standards). An example of anion traces in an iodide standard (1g/L) is given in Figure 1 .



More issues related to reference materials and CRM production are described in Issues 4-8 of our 2008 Analytix Newsletters, covering the following topics: traceability, uncertainty assignment, high-purity starting materials handling, production, packaging and stability studies. (Articles are also available on our web site: [sigma-aldrich.com/ic](http://sigma-aldrich.com/ic) )

As a leading supplier of high-quality products for all areas of analytical chemistry, Sigma-Aldrich offers several products to complement the Trace CERT standards product line. These additional products include certified eluent concentrates, high-purity water developed specifically for IC analysis, certified multi-element standards (PRIMUS) and an IQ/OQ/PQ kit for verification of linearity, repeatability, and carryover within the ion chromatographic system. To learn more about our complete line of IC products, please visit our website [sigma-aldrich.com/ic](http://sigma-aldrich.com/ic).

#### References

- 1] ISO/IEC 17025, General requirements for the competence of testing and calibration laboratories, 2005
- 2] ISO Guide 34, General requirements for the competence of reference material producers, 2000
- 3] ISO Guide 31, Reference materials – Contents of certificates and labels, 2000
- 4] Trace CERT Traceable Certified Reference Materials. Part 1: Swiss Precision Meets Analytical Competence. Analytix 2006 issue 5, 4-5.
- 5] Trace CERT Traceable Certified Reference Materials. Part 2: What Traceability Really Means. Analytix 2007 Issue 1, 7-9.
- 6] Trace CERT Traceable Certified Reference Materials. Part 3: Challenges in the Characterization of High-purity Starting Materials. Analytix, 2007 Issue 2, 4-5.
- 7] Trace CERT Traceable Certified Reference Materials. Part 4: Production, handling and Storage of High-precision Calibration Solutions. Analytix 2007 Issue 3, 6-8.
- 8] Trace CERT Traceable Certified Reference Materials. Part 5: Reliability is a Matter of Proper Uncertainty Calculation. Analytix 2007 Issue 4, 8-10.

## Featured Products

Trace CERT : IC Standards 1000 mg/L, 100 mL HDPE pkg.

Description	Matrix	Cat. No.
<b>Anion standards</b>		
Bromide	water	43147
Chloride	water	39883
Chromate	water	40121
Cyanide	water	90157
Fluoride	water	77365
Iodide	water	41271
Nitrate	water	74246
Nitrite	water (pH ~11)	67276
Phosphate	water	38364
Sulfate	water	90071
<b>Cation standards</b>		
Ammonium	water	59755
Barium	0.1% nitric acid	87142
Cadmium	0.1% nitric acid	69679
Calcium	0.1% nitric acid	39865
Cobalt	0.1% nitric acid	49594
Copper	0.1% nitric acid	40786
Lead Standard	0.1% nitric acid	51777
Lithium Standard	0.1% nitric acid	59878
Magnesium	0.1% nitric acid	89441
Manganese	0.1% nitric acid	51439
Nickel	0.1% nitric acid	42637
Potassium	water	53337
Sodium	water	43492
Strontium	0.1% nitric acid	42151
Zinc	0.1% nitric acid	67902

## Related Information

Inorganic trace analyses require extremely pure sample preparation reagents. Sigma-Aldrich offers a comprehensive range of reagents to satisfy all purity requirements.

Our new brochure presents all product groups of importance for inorganic trace analysis:

- Digestion/Dissolution Acids & Bases
- Matrix Modifiers for AAS
- Reducing Agents for Hydride AAS
- Solvents for Metal Speciation Analysis
- High Purity Water for IC

For more information on these reagent products, request brochure T408162 (LBJ), Inorganic Trace Analysis

