

Water & Snow Trace Element Analysis



DRI's Trace Chemistry Laboratory is dedicated to increasing the analytical capacity of water quality labs in developing countries through assessment of protocols and inter-laboratory comparisons.

LABORATORY EQUIPMENT

DRI's Trace Chemistry Laboratory includes two state-of-the-art Thermo Finnigan Element2 High Resolution-Inductively Coupled Plasma-Mass Spectrometry (HR-ICP-MS) instruments complete with autosampler for automated sample introduction. ICP-MS is a well-accepted technique for trace element concentration analysis. The instruments can operate in Low (LR), Medium (MR) and High (HR) resolution modes as needed for elimination of interferences and precise measurements. The instruments are optimized for long-term stability, excellent sensitivity and high signal-to-noise ratio. The two HR-ICP-MS and an Elga 18.2 mega ohm ultra-pure water system are housed in a 300 sq. ft. class 100 clean room. The Trace Chemistry Laboratory also includes a 200 sq. ft. cold lab (-15°C), a 400 sq. ft. wet chemistry lab and a 150 sq. ft. sample storage freezer (-20°C).

ELEMENTAL DRINKING WATER ANALYSIS PROCEDURE

For elemental analysis of drinking water samples, standard EPA procedures are followed. All standards are made from a mixed stock standard solution. All samples and standards are matrix matched. Calibration for elemental concentrations includes five standards and a blank. Quality Control (QC) is conducted using a blank and a check standard every 10 samples. Random samples are run in duplicate to test reproducibility. Typical drinking water elemental suite includes ~21 elements (see other side).



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DRI DRINKING WATER CHEMICAL ANALYSIS

ELEMENT	TYPICAL DETECTION LIMIT (PPB)	WHO GUIDELINE (PPB)
Ag	0.03	NG
Al	0.16	NG
As	0.03	10
Ba	0.07	700
Be	0.08	NG
Cd	0.03	3
Co	0.03	NG
Cr	0.02	50
Cu	0.04	2000
Fe	0.27	NG
Mn	0.04	NG
Mo	0.16	NG
Ni	0.04	70
Pb	0.03	10
Sb	0.01	20
Se	0.09	40
Sr	0.08	NG
Tl	0.03	NG
U	0.05	30
V	0.03	NG
Zn	0.31	NG

Full drinking water elemental suite analysis consists of ~21 elements and full quality control of each sample set. Please contact lab for pricing for trace element analysis of drinking water or other environmental samples.

ANALYSIS OF ENVIRONMENTAL SAMPLES

Snow: The Trace Chemistry Laboratory specializes in analysis of snow samples for both trace elements and light absorbing impurities. Measurements of trace elements – including silver, plutonium, black carbon, and size-resolved dust particles – have been used to underpin studies on cloud seeding, drivers of snowmelt, and ice core dating.

Other environmental samples: The Trace Chemistry Laboratory can perform analysis in a number of sample matrices, ranging from water to digested soil, dust, and biological samples. Please contact the lab for any inquiries.

TOP TO BOTTOM:

DRI's Ultratrace Laboratory staff organize and prepare samples for trace metal analysis in the Class 100 clean room that houses two Element2 mass spectrometers.



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