

Hydrogeochemistry Package ME-MS14HR

Ground and surface water analysis can be a valuable tool for geochemical exploration in areas where soil sampling is difficult or impossible, such as in swampy terrain. This package has been assembled to include everything required to perform a hydrogeochemical survey and includes analysis for Trace Metals, Total Dissolved Solids, Conductivity, Alkalinity, pH and Anions by various methods as described below.

Samples must be submitted in pairs (one sample untreated and one acidified) in the bottles provided. Supplies included in the package are:

- Acid-washed, pre-labelled 250mL sample bottle pairs for untreated and acidified samples
- Ultra-pure Nitric Acid in pre-measured ampoules
- Disposable 45 micron filters
- Syringes for field filtration
- Bottles of de-ionised water for field blanks
- Coolers with optional ice packs for sample shipping and transportation

NOTE: This method is not suitable for surface or groundwater with high dissolved solids or metals content, mine effluent, or brackish/salt water. Other methods may be available for waters of these types.

Trace Metals in Water

The acidified sample is analysed directly by high resolution Inductively Coupled Plasma – Mass Spectrometry (HR-ICPMS) with the following list of analytes reported:

Analyte	Symbol	Units	Lower Limit	Analyte	Symbol	Units	Lower Limit
Silver	Ag	µg/L	0.005	Sodium	Na	mg/L	2
Aluminium	Al	µg/L	3	Nickel	Ni	µg/L	0.2
Arsenic	As	µg/L	0.05	Phosphorus	P	mg/L	0.3
Boron	B	µg/L	5	Lead	Pb	µg/L	0.05
Barium	Ba	µg/L	0.1	Rubidium	Rb	µg/L	0.02
Beryllium	Be	µg/L	0.005	Rhenium	Re	µg/L	0.005
Bismuth	Bi	µg/L	0.05	Antimony	Sb	µg/L	0.01
Calcium	Ca	mg/L	0.05	Selenium	Se	µg/L	0.2
Cadmium	Cd	µg/L	0.005	Silicon	Si	mg/L	0.05
Cobalt	Co	µg/L	0.05	Tin	Sn	µg/L	0.2
Chromium	Cr	µg/L	0.5	Strontium	Sr	µg/L	0.05
Caesium	Cs	µg/L	0.005	Tellurium	Te	µg/L	0.01
Copper	Cu	µg/L	0.5	Thorium	Th	µg/L	0.005
Iron	Fe	mg/L	0.03	Titanium	Ti	µg/L	0.2
Gallium	Ga	µg/L	0.05	Thallium	Tl	µg/L	0.002
Mercury	Hg	µg/L	0.05	Uranium	U	µg/L	0.002
Potassium	K	mg/L	2	Vanadium	V	µg/L	0.05
Lithium	Li	µg/L	0.2	Tungsten	W	µg/L	0.01
Magnesium	Mg	mg/L	1	Yttrium	Y	µg/L	0.005
Manganese	Mn	µg/L	0.2	Zinc	Zn	µg/L	3
Molybdenum	Mo	µg/L	0.05	Zirconium	Zr	µg/L	0.05

Mercury

The acidified sample is cold-oxidized using bromine monochloride then reduced with stannous chloride. Mercury is determined by Cold Vapour Atomic Absorption Spectroscopy or Atomic Fluorescence Spectrometry.

Analyte	Symbol	Units	Lower Limit
Mercury	Hg	µg/L	0.05

Total Dissolved Solids (TDS)

Total dissolved solids are determined on the untreated sample by filtering a sample through a glass fibre filter and evaporating the filtrate to dryness at 180°C.

Analyte	Symbol	Units	Lower Limit
Total Dissolved Solids	TDS	mg/L	3

Conductivity

Conductivity is determined on the untreated sample using a conductivity electrode.

Analyte	Symbol	Units	Lower Limit
Conductivity	Conductivity	µS/cm	2

Alkalinity

Total alkalinity is determined on the untreated sample by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.

Analyte	Symbol	Units	Lower Limit
Alkalinity	Alkalinity	mg/L	1

pH

The pH of the untreated sample is determined using a pH electrode.

Analyte	Symbol	Units	Lower Limit
pH	pH	pH units	0.1

Anions

The following anions are analysed by Ion Chromatography.

Analyte	Symbol	Units	Lower Limit
Bromine	Br	mg/L	0.05
Chlorine	Cl	mg/L	0.5
Fluorine	F	mg/L	0.02
Nitrite	NO ₂	mg/L	0.001
Nitrate	NO ₃	mg/L	0.005
Sulphate	SO ₄	mg/L	0.5