# Method 39 – Trace Levels in Water

**Sample Size: 30-50 mL**

## Summary

Samples are acidified with concentrated nitric acid (HNO3) then analyzed by ICP-OES and ICP-MS.

## Method 39 Elements and Reporting Limits

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| Element | Lower Limit |
| Ag, Silver | 0.02 ppb |
| Al, Aluminum | 1 ppb |
| As, Arsenic | 1 ppb |
| Au, Gold | 0.01 ppb |
| B, Boron | 5 ppb |
| Ba, Barium | 0.01 ppb |
| Be, Beryllium | 0.05 ppb |
| Bi, Bismuth | 0.005 ppb |
| Ca, Calcium | 50 ppb |
| Cd, Cadmium | 0.002 ppb |
| Ce, Cerium | 0.01 ppb |
| Co, Cobalt | 0.01 ppb |
| Cr, Chromium | 0.02 ppb |
| Cs, Cesium | 0.01 ppb |
| Cu, Copper | 0.1 ppb |
| Fe, Iron | 20 ppb |
| Ga, Gallium | 0.01 ppb |
| Ge, Germanium | 0.05 ppb |
| Hf, Hafnium | 0.01 ppb |
| Hg, Mercury | 0.2 ppb |
| In, Indium | 0.01 ppb |
| K, Potassium | 100 ppb |
| La, Lanthanum | 0.001 ppb |
| Li, Lithium | 0.01 ppb |
| Mg, Magnesium | 1 ppb |
| Mn, Manganese | 0.05 ppb |
| Mo, Molybdenum | 0.01 ppb |
| Na, Sodium | 10 ppb |
| Nb, Niobium | 0.01 ppb |
| Ni, Nickel | 0.1 ppb |
| P, Phosphorous | 100 ppb |
| Pb, Lead | 0.01 ppb |
| Rb, Rubidium | 0.01 ppb |
| Re, Rhenium | 0.01 ppb |
| S, Sulfur | 20 ppb |
| Sb, Antimony | 5 ppb |
| Sc, Scandium | 0.2 ppb |
| Se, Selenium | 0.5 ppb |
| Sn, Tin | 0.02 ppb |
| Sr, Strontium | 0.01 ppb |
| Ta, Tantalum | 0.05 ppb |
| Te, Tellurium | 0.01 ppb |
| Th, Thorium | 0.1 ppb |
| Ti, Titanium | 0.1 ppb |
| Tl, Thallium | 0.005 ppb |
| U, Uranium | 0.001 ppb |
| V, Vanadium | 0.05 ppb |
| W, Tungsten | 0.02 ppb |
| Y, Yttrium | 0.01 ppb |
| Zn, Zinc | 1 ppb |
| Zr, Zirconium | 0.05 ppb |

## Analytical Performance

Data is deemed acceptable if recovery for all 51 elements is ±15% at five times the Lower Limit of Determination (LOD) and the calculated Relative Standard Deviation (RSD) of duplicate samples is no greater than 15%.