

ICP/MS

What's It All About?

Federal and State risk assessment programs and discharge permits typically require industries and their laboratories to provide low concentration (part per trillion) analyses for organic and inorganic constituents. Inductively coupled plasma/mass spectrometry (ICP/MS) metals analysis offers many benefits over historic graphite furnace analysis including lower unit fees, shorter turnaround time, and the confidence of mass spectral identification. Simultaneous ICP/MS instruments are capable of analyzing multiple elements in one analytical run, providing significant time savings when compared to single element graphite furnace analysis. Below are the Lancaster Labs method detection limits (MDL) and limits of quantitation (LOQ) for aqueous matrices for several common ICP/MS elements:

<u>Element</u>	<u>MDL (ug/L)</u>	<u>LOQ (ug/L)</u>
Antimony	0.09	0.5
Arsenic	0.059	0.2
Chromium	0.07	1.0
Copper	0.2	1.0
Nickel	0.05	0.2
Selenium	0.2	1.0
Lead	0.2	1.0
Thallium	0.13	0.5

How Does It Work?

Inductively coupled plasma mass spectroscopy (ICP-MS) is a powerful combination of several processes. The sample is pumped into the sample introduction system comprised of a spray chamber and nebulizer to form an aerosol. This aerosol then undergoes ionization in an argon plasma source at 6500 degrees Kelvin (11,000 degrees Fahrenheit). Next, the ions are introduced into the mass spectrometer, where a quadrupole mass filter separates the ions so they can be detected. Data typically consists of a plot of signal intensities versus the mass. This can be used to determine the concentration of each analyte present in the sample. Most elements are made up of several isotopes, and their ratios can be used to further confirm the presence of specific elements.

How We Can Help.

Lancaster Laboratories performs ICP/MS analyses using SW-846 6020 and EPA 200.8 methods. And because the ICP/MS analyzes samples more quickly, Lancaster Labs can provide shorter turnaround times using ICP/MS, thereby meeting clients' often urgent analytical needs. Therefore, if lower detection limits and faster turnaround time for trace metal determinations are required, call your Lancaster Laboratories client service specialist or one of our environmental inside business development specialists for more information at (717) 656-2300.

Lancaster Laboratories is one of the largest commercial testing labs in the nation with more than 750 scientists, technicians, and support personnel in our 175,000-square-foot facility.

