Specifications for High Resolution ICP-MS

The Chemistry Division requires a high-resolution Inductively-coupled Plasma Mass Spectrometer (ICP-MS) for the detection of trace elements. NRL will couple this ICP-MS with other sample analysis and preparation instruments for a unique one-of-a-kind research analytical chemistry tool.

The following minimum instrument specifications are required including installation:

The minimum specification of this instrument include:

- Mass Resolution: 300, 4,000, 10,000 (10% valley, equivalent to 5% height);
- 600, 8,000, 20,000 (FWHM);
- Dynamic Range, > 109 linear with automatic gain calibration ;
- Sensitivity using a concentric nebulizer: >1 x 10^9 cps/ppm In;
- Detection: < 1 ppq for non-interfered nuclides;
- Signal Stability: < I % RSD over 10 minutes and < 2 % RSD over 1 hour;
- Dark Noise: < 0.2 cps;
- Scan Speed (magnetic) m/z 7 to 240 to 7: < 150 ms;
- Scan Speed independent of mass range (electric): I ms/jump;
- Oxide and doubly charged ions measured: < 0.002 for BaO+/Ba+ and < 0.03 for Ba2+/ Ba+;
- Standard sample inlet

The following instrument control, monitoring, acquisition and analysis software must be provided:

- Quantification algorithms for elemental analysis (qualitative, quantitative, semi-quantitative, isotope dilution), isotope ratio and time resolved modes;
- Auto-tuning of parameters, including ICP parameters, torch position, lenses and multiplier voltage;
- Fully automated and configurable plasma start and stop sequence;
- Integrated powerful QA/QC package that meets internationally regulated requirements including US EPA 200.8, 6020;
- Real time display of spectra, calibration curves, fully quantitative results and time resolved analyses;
- On-line export of time resolved data in several formats (ASCII, GRAMS, Spectacle, GLITTER, ANDI Xcalibur®) for further analysis in third party programs.