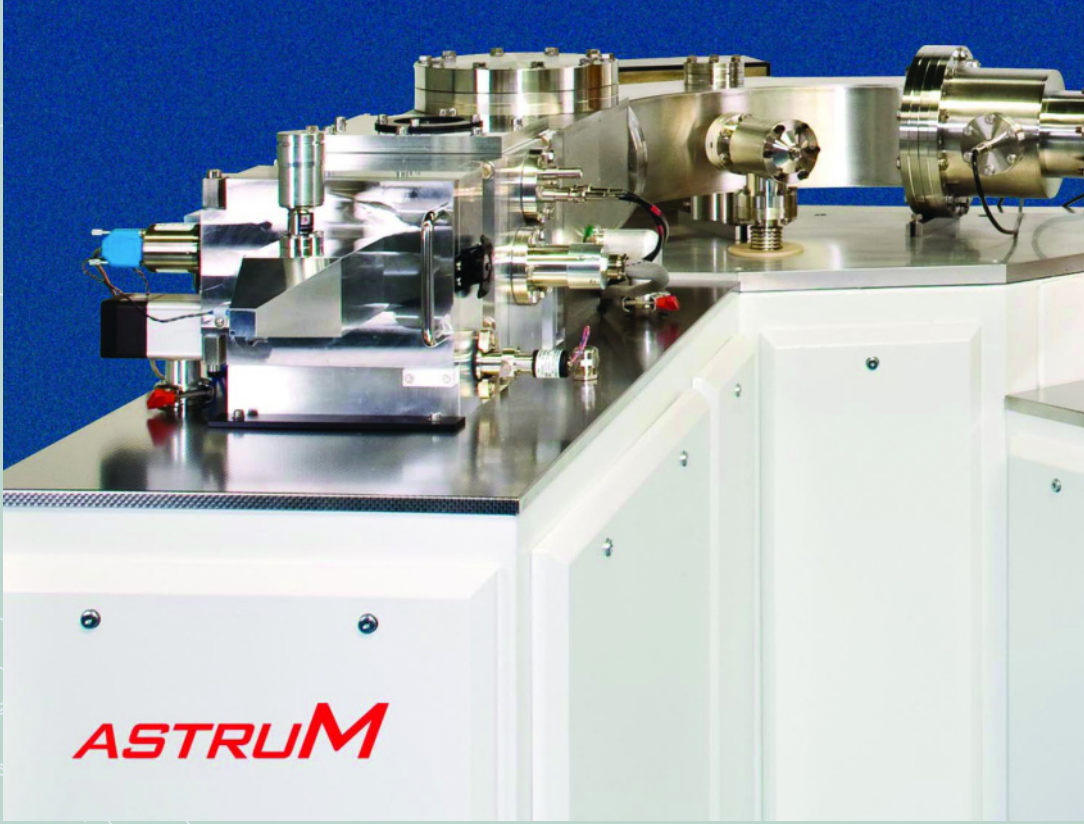


nu instruments

Instruments that work

# ASTRUM HIGH RESOLUTION GD-MS

## Performance Specifications

| | |
|---|---|
| **Resolution:** | Continuously variable resolution |
| **Average Background:** | <0.5 counts per second (cps) |
| **Operating Analyser Pressure:** | <2 x $10^{-7}$ mbar |
| **Matrix Current:** | >5x$10^{-10}$ amps at RP > 4000 (Using total Cu signal) |
| **Signal Stability:** | <3% RSD over 10 minutes (Using Cu @ RP=4000)<br><5% RSD over 30 minutes (Using Cu @ RP=4000) |
| **Peak Side Stability:** | <+/-30ppm over 30 minutes (Using mass 63) |
| **Acquisition Mass Stability:** | <100ppm from Li to U |
| **Ion Counting Efficiency:** | >70% relative to Faraday |
| **Abundance Sensitivity:** | mass 62 (baseline) / Cu63 <200ppb at RP > 4000 |
| **Internal Reproducibility:** | Major < 3%RSD<br>Minor < 5%RSD<br>Trace < 10%RSD |
| **External Reproducibility:** | Major < 5%RSD<br>Minor < 10%RSD<br>Trace < 20%RSD |
| **Gas Background:** | C < 1ppm (gas and matrix RSF values set to 1)<br>N < 1ppm (gas and matrix RSF values set to 1)<br>O < 1ppm (gas and matrix RSF values set to 1) |

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# ASTRUM

## HIGH RESOLUTION GD-MS

**Nu Instruments introduce the next generation of glow discharge mass spectrometers. The ion source has been purpose designed in collaboration with users to provide the best in performance, reliability and flexibility.**

**The double-focusing, high-resolution magnetic sector mass spectrometer is based on the successful Nu AttoM HR-ICP-MS for accurate and precise elemental analysis.**

**The no-compromise design of the Nu Astrum GD-MS provides the best in solids analysis.**

**Resolution**
Continuously variable resolution. Both Source and Collector slits are continuously variable and computer controlled

**Average Background**
<0.5 counts per second (cps), Average baseline signal at masses where no ion beam signal exists, for example 220.5 amu.

**Operating Analyser Pressure**
$<2 \times 10^{-7}$ mbar, under full gas load. The analyser section of the instrument (ESA, Flight Tube, and Collector) is all metal sealed and pumped using ion pumps

**Matrix Current**
$>5x10^{-10}$ amps at RP > 4000, using total Cu signal of a Cu sample

**Signal Stability**
Using a Cu acquisition routine with parameters of RP > 4000, 200 points per peak window, 2 sweeps per isotope, and 1 cycle, the peak area of masses 63 and 65 using a Cu sample will be:
<3% RSD over 10 minutes (5 repeats)
<5% RSD over 30 minutes (15 repeats)

**Peak Side Stability**
At RP > 4000, the peak side stability will be shown to be <+/-30ppm over 30 minutes using a Cu sample and monitoring mass 63

**Acquisition Mass Stability**
Using the data acquisition program, the position of peaks will be shown to be within 100ppm in mass (demonstrated using peaks from C up to Ta)

**Ion Counting Efficiency**
The electron multiplier will have an efficiency of >70% relative to the Faraday amplifier when the multiplier supply voltage is set within the plateau

**Abundance Sensitivity**
Using a Cu matrix and a resolution of > 4000, the abundance sensitivity measured at mass 62 will be <200ppb relative to mass 63

**Internal Reproducibility**
Using a homogeneous reference material, measurements will be made on one major (approx 10 – 50%), one minor (approx 0.1%), and one trace element (approx 1ppm). From five repeat measurements, the following reproducibility will be demonstrated:
Major < 3%RSD
Minor < 5%RSD
Trace < 10%RSD

**External Reproducibility**
The sample used in the previous test will be withdrawn, dismounted then re-inserted and a further five analyses performed. The difference between the certified concentrations and the average concentrations measured will be:
Major < 5%RSD
Minor < 10%RSD
Trace < 20%RSD

**Gas Background**
Using a pure Ta sample, and by measuring ion beam ratio relative to Ta, the levels of gas background will be shown to be less than:
C < 1ppm
N < 1ppm
O < 1ppm
Assuming that the RSF values for the gases and the matrix element(s) are set to 1.000. Measurements will be made after a suitable pre-sputter time using a cryo-cooled cell