

ICP - Mass Spectrometry

NexION® 2000 ICP-MS



The following performance can be measured under a single set of optimized conditions for each mode.

Detection Limits

Based on three times the standard deviation of the blank using three-second integration time and peak hopping at 1-point per mass.

Element	Detection Limits ng/L (ppt)
⁹ Be	< 0.5
⁵⁶ Fe	< 1.5 (Reaction mode, with ammonia)
⁵⁹ Co	< 0.5
¹¹⁵ In	< 0.25
²³⁸ U	< 0.25

Sensitivity

Element	Sensitivity Mcps/mg/L
⁹ Be	> 6
¹¹⁵ In	> 100
²³⁸ U	> 80

Oxide and Doubly-charged Species

Measured under identical operating conditions used to achieve sensitivity and detection-limit specifications.

CeO ⁺ /Ce ⁺	< 0.025
Ce ⁺⁺ /Ce ⁺	< 0.03

Background Signal

Mass 220	< 1 cps
----------	---------

Short-term Precision

Defined as the relative standard deviation (% RSD) for a 1-10 µg/L multi-element solution, automatically cycling between Standard, Reaction and Collision modes, using a 3-second integration time, without internal standardization.

< 3% RSD

Long-term Stability

Relative stability after a one-hour warm-up period. Defined as the relative standard deviation of the mean signal for a 1-10 µg/L multi-element solution, automatically cycling between Standard, Reaction and Collision modes, measured once every 10 minutes, without internal standardization.

< 4% RSD over four hours

Isotope-ratio Precision

Defined for the isotope ratio of ¹⁰⁷Ag/¹⁰⁹Ag. Obtained using single-point peak hopping.

< 0.08*% RSD (*or within a factor of two of the counting statistics limit)
--

Mass Calibration Stability

Measured using a 1 µg/L multi-element solution containing ⁷Li, ²⁴Mg, ¹¹⁵In and ²³⁸U. Defined in terms of the shift in spectral position corresponding to maximum spectral peak intensity for each element, obtained without the use of multiple-point, peak-searching algorithms.

< 0.05 amu over eight hours of continuous operation

Quadrupole Peak Hop (Slew) Speed

Defined as the maximum rate at which the quadrupole can jump over 160 amu without affecting the precision of the analytical measurement.

1.6 M amu/sec

Quadrupole Scan Speed

Defined as the maximum rate at which the quadrupole can be scanned while acquiring continuous spectral data at every mass from the minimum to the maximum mass of the instrument (1-285 amu).

5000 amu/sec

Abundance Sensitivity

Defined as the intensity of a given isotope at spectral peak maximum, relative to the intensity of that isotope at 1 amu lower and at 1 amu higher than the mass position corresponding to peak maximum.

Measured at ²³⁸ U
Better than 1.0 x 10 ⁻⁶ at low mass side of peak
Better than 1.0 x 10 ⁻⁷ at high mass side of peak

Detector Linear Range

The SimulScan™ detection system operates from < 0.1 cps to > 10⁹ cps. This provides over 10 orders of magnitude of linear dynamic range in a single continuous scan.

Transient Data Acquisition Speed

> 3000 temporal data points/sec maximum
