NexION® 2200 ICP-MS Performance Specifications

SPECIFICATIONS

ICP - Mass Spectrometry

The following manufacturing specifications are tested and verified by PerkinElmer on each instrument during production.

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	Manufacturing Specs ng/L (ppt)	Typical Specs ng/L (ppt)**
^{9}Be	≤ 0.4	≤ 0.2
^{56}Fe*	≤ 1.5 (Reaction mode with ammonia)	≤ 0.75
^{115}In	≤ 0.05	≤ 0.02
^{209}Bi	≤ 0.05	≤ 0.02

* Depending on the cleanliness of the laboratory and the chemicals being used.
** Typical specifications are typically achievable specifications that are not checked during manufacturing and installation.

Sensitivity

Element	Manufacturing Specs Mcps/(mg/L)	Typical Specs Mcps/(mg/L)**
^{7}Li	> 70	> 140
^{59}Co		> 400
^{89}Y		> 700
^{115}In	> 400	> 700
^{205}Tl		> 500
^{238}U	> 300	> 350

** Typical specifications are typically achievable specifications that are not checked during manufacturing and installation.

PerkinElmer®
For the Better

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

System Background Signal

Mass 220.5	≤ 1 cps

Detector Background Signal

Mass 220.5	≤ 0.1 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 three-second integration time, without internal standardization.

< 2% RSD over 10 minutes

Long-Term Stability

Warm stability is relative stability tested after a one-hour warm-up period. Cold stability is relative stability tested without a 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.

Warm stability: < 3% RSD over 2 hours
Cold stability: < 4% RSD over 4 hours

Isotope-Ratio Precision

Defined for the isotope ratio of $^{107}Ag/^{109}Ag$. 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 ^{7}Li, ^{24}Mg, ^{115}In and ^{238}U. 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 8 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 5.0×10^{-7} at low mass side of peak
Better than 1.0×10^{-7} at high mass side of peak

Detector Linear Range

The SimulScan™ detection system operates from < 0.1 cps to > 10^9 cps. This provides over 10 orders of magnitude of linear dynamic range in a single continuous scan. The linear dynamic range can be further increased to 14 orders of magnitude when Extended Dynamic Range (EDR) functionality is used.

Transient Data Acquisition Speed

> 3000 temporal data points/sec maximum
Up to 100,000 temporal data points/sec in Nano or Single Cell detection mode

Regulatory and Safety Compliance

The NexION 2200 ICP-MS meets worldwide compliance requirements for safety, EMC and environmental regulations. All units have been developed and produced under a quality system certified to ISO 9001 and carry the European CE mark. All certificates are openly available on the PerkinElmer website.

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