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ELAN 9000 ICP-MS Specifications

Detection Limits

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

Element	ng/L (ppt)
⁹ Be	<9
⁵⁹ Co	<2
¹¹⁵ In	<0.5
²³⁸ U	<0.5

Sensitivity:

Element	ng/L (ppt)
²⁴ Mg	>10
¹¹⁵ In	>40
²³⁸ U	>30

Oxide and Doubly-Charged Species

Measured without the use of a desolvation device such as a chilled spray chamber and under identical operating conditions used to achieve sensitivity and detection-limit specifications.

CeO ⁺ /Ce ⁺	<3%
Ba ⁺² /Ba ⁺	<3%

Background Noise

Stability of the background defined as the standard deviation of the background signal.
Mass 220 <5 cps

Short-Term Precision

Defined as the coefficient of variation (% RSD) for a 10- μ g/L multielement solution, measured once every 10 minutes, without internal standardization.

<4% RSD over 4 hours

Isotope-Ratio Precision

Defined for the isotope ratio of $^{107}\text{Ag}/^{109}\text{Ag}$ using a 50- μ g/L Solution. Obtained using single-point peak hopping.

<0.2% RSD

Mass Calibration Stability

Measured using a 10- μ g/L multielement solution containing ^{24}Mg , ^{103}Rh and ^{208}Pb . 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

Peak-Hopping Settling Time

Defined as the time taken to settle electronics after peak hopping to a discrete pass position. Normal Pulse counting Mode: 200 μ sec; Extended Dynamic Range Mode: 3msec

Quadrupole Scan Speed

Defined as the maximum rate at which the quadrupole can be scanned.

<2400 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 ^{23}Na :

Better than 1.0×10^6 at low mass side of peak

Better than 1.0×10^7 at high mass side of peak

Detector Linear Range

The SimulScantm detection system operates from 1 cps to 10^9 cps. This provides over 8 orders of magnitude of linear dynamic range in a single continuous scan.

Sample Washout

Measured after introduction of a 1% nitric acid solution immediately following continuous aspiration of 100 µg/L Rh for one minute: Signal for ¹⁰³Rh drops by at least three orders of magnitude in less than 30 seconds.

Regulatory and Safety Compliance

The ELAN[®] 9000 carries the C E Mark and fully meets the regulatory and safety standards below:

- CAN CSA C22.2 No. 1010-1; Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory Use
- UL Std. No. 3101; Electrical Equipment for Laboratory Use
- FCC Part 15, Class A
- European Low Voltage Directive 73/23/EEC (LVD) and its standards EN61010-1 and EN61010-2-061
- European EMC Directive 89/336/EEC and 92/31/EEC and its standards EN55011:1998 (Class A) and EN61326-1:1997

Dimensions and Installation Requirements

For a detailed description of instrument dimensions, services, power and environmental requirements, please refer to “Preparing Your Laboratory for the ELAN[®] 9000 ICP Mass Spectrometer”.

Dimensions

99 cm x 117 x 73 cm (W x H x D), 295 kg

Note: Specifications are valid for ELAN[®] 9000 instruments manufactured after May 2002.



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