Data Sheet

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Trusted Answers

Agilent 7850 ICP-MS Typical Performance and Specifications

Free your workflow from common time traps

Free your ICP-MS analysis from time traps with the Agilent 7850 ICP-MS. It's the smart way to reduce wasted time, so busy staff can focus on tasks that deliver more value to your lab.

The 7850 ICP Mass Spectrometer can handle samples with up to 25% solids, reducing the time labs need to spend on sample preparation. The instrument features a Helium mode collision cell and half mass correction that control common polyatomic and doubly charged ion interferences. Better control of spectral overlaps makes method development simpler and reduces data errors that can lead to time-wasting sample remeasurement.

Instrument

Sample introduction system

Peristaltic pump	10-roller, 3 channels
Nebulizer	MicroMist (borosilicate glass)
Spray chamber	Scott-type double-pass (quartz) Controlled temperature range: −5 °C to +20 °C
Ultra High Matrix Introduction (UHMI) system	Included

Plasma

RF generator	Solid state digital drive 27 MHz Variable-frequency impedance matching 500 W to 1600 W
Torch	One-piece (quartz) 2.5 mm id injector ShieldTorch system
Torch position	Horizontal and vertical position: ±2 mm, in 0.1 mm steps Sampling depth: 3 to 28 mm, in 0.1 mm steps
Mass flow controllers (Ar)	4: Plasma, Aux., Carrier, Make up/Dilution
5th gas line for alternative carrier gas	Optional

Interface

Sampling cone	1 mm diameter orifice Standard: Ni-tipped with Cu base Optional: Pt-tipped with Cu base
Skimmer cone	0.4 mm diameter orifice Standard: Ni Optional: Pt-tipped with Cu base

Ion lens

Lens system	Extraction lens Off-axis Omega lens

Octopole Reaction System (ORS)

He (collision) cell gas line	Included
H_2 (reaction) cell gas line	Optional
3rd cell gas line (low- or high-flow rate)	Optional

Mass analyzer

Quadrupole	Frequency: 3 MHz Hyperbolic rod profile
Mass range	2–260 u
Mass resolution	Variable from 0.3 u to 1.0 u
Typical mass stability	≤ 0.05 u per day ≤ 0.1 u per 6 months
Abundance sensitivity (at Cs)	Low mass side: ≤ 5×10^{-7} High mass side: ≤ 1×10^{-7}

Detector

Configuration	Orthogonal Detector System (ODS)
Detector	Dual-mode discrete dynode electron multiplier
Dynamic range	10 orders (0.3 cps to 4 Gcps)
Minimum integration time	100 µs
Minimum dwell time (TRA mode)	3 ms (standard), 0.1 ms (optional)

Vacuum system

Configuration	Three-stage differential vacuum system
Vacuum pump	Single split-flow turbo molecular pump Single external rotary pump
Vacuum pump hose length	1.5 m, 3 m (optional)

Software

Instrument contol software	ICP-MS MassHunter Workstation software
User access control software	Optional
Chromatographic software	Optional
Single nanoparticle application module	Optional
Intelligent sequencing software	Optional
Three offline user licenses	Optional

Accessories and peripherals

Autosamplers

Agilent SPS 4 Autosampler
Agilent Integrated Autosampler (I-AS)

Sample introduction

Integrated Sample Introduction System 3
PFA Inert Sample Introduction Kit
Organic Solvent Introduction Kit
Humidifier

Speciation kits

LC-ICP-MS Speciation Kits
Arsenic Speciation Kit
Chromium Speciation Kit
Capillary LC Interface Kit

Peripherals

Water recirculator
Water chiller
Optional hood
Quiet cover for rotary pump

Instrument performance

The factory shipping specifications that are confirmed at the factory represent minimum requirements for shipping approval. The actual performance of the Agilent ICP-MS is invariably much higher. The two tables below provide the typical performance of the Agilent 7850 ICP-MS, together with the factory shipping specifications.

No Gas mode		Factory Specifications[1]	Typical Performance[2]
Sensitivity (Mcps/ppm)	^{7}Li	50	110
	^{59}Co		180
	^{89}Y	160	270
	^{115}In		320
	^{205}Tl	80	340
	^{238}U		540
Background	*m/z* 9	≤1 cps	≤0.3 cps
Detection limits	^{9}Be	≤0.5 ppt	≤0.1 ppt
	^{115}In	≤0.1 ppt	≤0.04 ppt
	^{209}Bi	≤0.1 ppt	≤0.04 ppt
Oxide	CeO/Ce CeO/Ce (HMI-25)	≤1.5% ≤0.5%	≤1.8%
Doubly charged	Ce^{2+}/Ce	≤3%	≤2.5%
Stability	20 min	≤2.0% RSD	≤1.0% RSD
	2 hr	≤3.0% RSD	≤1.2% RSD
Isotope ratio precision	^{107}Ag/ ^{109}Ag	≤0.1% RSD	≤0.1% RSD

He Gas mode		Typical Performance[2]
Sensitivity (Mcps/ppm)	^{59}Co	47
Background	*m/z* 9	≤0.2 cps
Interference reduction factor[3]	^{59}Co/^{51}ClO	>30
Oxide	CeO/Ce	≤0.5%
Detection limits[3]	^{75}As	≤10 ppt

1. Factory Shipping Specifications. These specifications are detailed in the Agilent publication: Agilent 7850 ICP-MS, Specifications (Publication number: 5994-2857EN).
2. This typical performance is defined under the Oxide ≤1.8% condition and is not checked during the standard installation.
3. Performed in a matrix of 2% HNO_3 + 0.5% HCl.

Site requirements and safety

Mainframe dimensions

Width	730 mm (main cabinet, excluding peri-pump)
Depth	600 mm (main cabinet, excluding power cord)
Height	595 mm (main cabinet, excluding exhaust chimney)
Weight	100 kg

Largest shipping container

Width	1,020 mm
Depth	1,120 mm
Height	1,000 mm
Weight	148 kg

Environmental

Operating temperature

Range	15–30 °C
Rate of change	<2 °C/hr (max. change 5 °C)

Operating humidity

20-80% (non-condensing)

Utilities

Electricity supply

Voltage	Single Phase, 200-240 V, 50/60 Hz
Current	30 A

Cooling water

Inlet temperature	15-40 °C
Minimum flow rate	5 L/min
Inlet pressure	230–400 kPa

Argon gas supply

Minimum purity	99.99 %
Maximum flow rate	20 L/min
Supply pressure	500-700 kPa

Cell gas supply

Minimum purity	99.999%
Maximum flow rate	12 mL/min for He and 10 mL/min for H_2
Supply pressure	90-130 kPa for He 20-60 kPa for H_2

Exhaust duct

Vent Type	Single vent, 150 mm diameter
Flow rate	5-7 m^3/min

Regulatory compliance

Safety

IEC 61010-1:2010 / EN 61010-1:2010
IEC 61010-2-061:2015 / EN 61010-2-061:2015
IEC 61010-2-081:2015 / EN 61010-2-081:2015
Canada: CAN/CSA C22.2 No. 61010-1-12
Canada: CAN/CSA C22.2 No. 61010-2-061:15
Canada: CAN/CSA C22.2 No. 61010-2-081:15
USA: UL 61010-1 (3rd Edition)
USA: UL 61010-2-061:2015
USA: UL 61010-2-081:2015
IEC 62311:2007 / EN 62311:2008

EMC

IEC 61326-1:2012 / EN 61326-1:2013
Canada: ICES-001:2006

ISO

Manufactured at an ISO 9001 and ISO 14001 certified facility

www.agilent.com/chem/7850icpms

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