



Dual-Cell System and Advanced Helium Mode

Higher sensitivity. Superior interference removal.



Higher sensitivity and superior interference removal than traditional He-KED

Collision/reaction cell technology helps reduce spectral interferences in ICP-MS. Traditional helium kinetic energy discrimination, or He-KED, is widely used because it is simple and broadly effective. However, routine methods often require multiple tune modes to balance sensitivity, interference removal, and acquisition time.

The Agilent 9500 ICP-MS advances helium-based interference removal with the proprietary Dual-Cell System (DCS) and Advanced Helium Mode (AHM), delivering higher sensitivity, superior interference removal, and simpler method setup.

The Dual-Cell System: dual design, dual mechanism

Positioned between Q1 and Q2, the Dual-Cell System uses two independently controlled ion guides to support precise ion movement through the cell. This design enables two complementary interference removal mechanisms: Kinetic Energy Discrimination (KED) and Collision-Induced Dissociation (CID).

By combining KED and CID, DCS helps suppress challenging polyatomic interferences while maintaining strong sensitivity across the mass range, overcoming limitations of traditional He-KED and high-energy helium modes.

Evolution of Agilent's Collision Reaction Cell (CRC) technology

- **2001:** First ICP-MS with Octopole Reaction System
- **2011:** HEHe mode introduced using collision-induced dissociation
- **2012:** First triple quadrupole ICP-MS launched
- **2016:** Second-generation ICP-QQQ with Axial Acceleration
- **2026:** DCS and AHM introduced for the Agilent 9500 ICP-MS

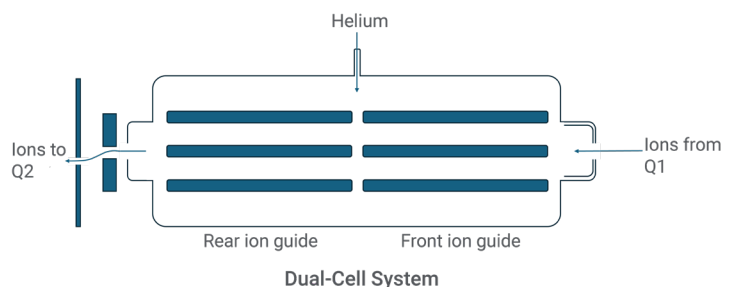


Figure 1. Schematic of the Agilent Dual-Cell System (DCS). DCS uses two independently controlled ion guides to support kinetic energy discrimination and collision-induced dissociation in Advanced Helium Mode.

Advanced Helium Mode: one streamlined mode

Advanced Helium Mode builds on the simplicity of traditional He mode while improving sensitivity, interference removal, and productivity. AHM dynamically optimizes DCS conditions across the mass range, improving ion transmission for low-mass elements while maintaining effective interference removal for higher masses.

For many routine applications, AHM can replace multiple tune modes, including no gas, He, and HEHe. This reduces cell gas switching and stabilization delays, simplifying methods and shortening acquisition times.

A new standard for helium-based interference removal

With the Dual-Cell System and Advanced Helium Mode, the Agilent 9500 ICP-MS helps laboratories achieve faster, more sensitive, and more reliable results without complex multi-tune workflows.

Performance gains with AHM

AHM delivers around 20x higher sensitivity for low-mass analytes such as Be and B compared with conventional He mode. It also provides around 2x higher sensitivity for mid- to high-mass elements and can reduce data acquisition time by more than 33% while maintaining detection limits.

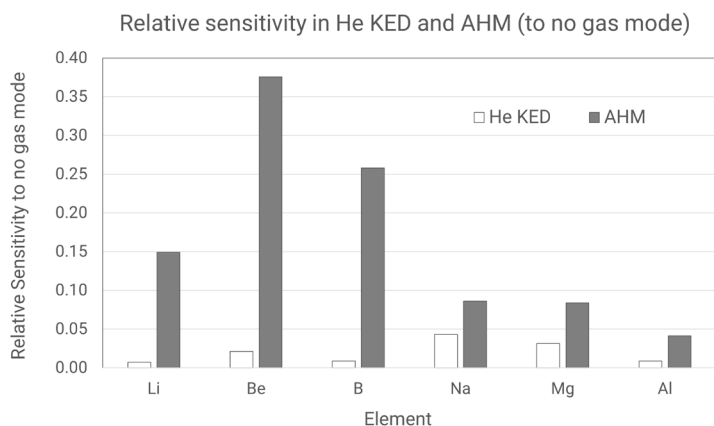


Figure 2. Relative sensitivity in He and AHM compared with no gas mode. AHM boosts sensitivity for low-mass analytes, including Li, Be, and B, compared with conventional He mode.

Proven interference removal in challenging matrices

In carbon-rich, chloride, calcium, and barium matrices, AHM delivered higher sensitivity and lower background equivalent concentrations than conventional He mode. These results demonstrate how DCS and AHM help improve data quality while simplifying routine ICP-MS/MS operation.

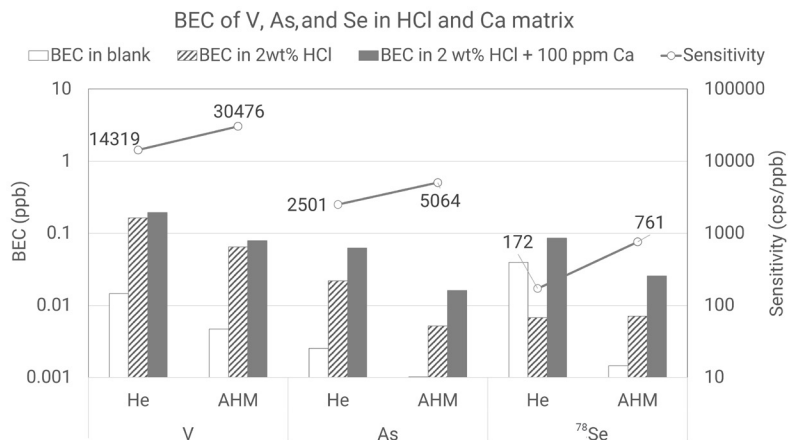


Figure 3. Comparison of Cl and Ca interference removal by He mode and AHM. In a chloride and calcium matrix, AHM provides higher sensitivity and lower BECs for V, As, and Se compared with conventional He mode.

Learn more about the Agilent 9500 ICP-MS

www.agilent.com/chem/9500icpqqq

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