

The New Agilent 7500ce ICP-MS – Revolutionizing Environmental Trace Metal Analysis

Designed for the demanding applications found in routine laboratories analyzing environmental, clinical and other high matrix samples, the 7500ce inductively coupled plasma mass spectrometer (ICP-MS) from Agilent Technologies provides the best detection limits for trace elements in the toughest sample types, ranging from wastewater, seawater and soils to foods and biological samples.

This rugged new instrument incorporates several new design features including a simple-to-use Octopole Reaction System (ORS) for interference removal in high matrix samples. Redesigned ion optics and a novel, high transmission reaction cell give the 7500ce 5x sensitivity increase over its predecessor, the 7500c, enabling low ppt detection limits in a wide range of complex matrices. Plasma and cell gases are controlled by a new, Agilent-designed Active Flow Control system, and ICP RF power is supplied by Agilent's new digital-drive RF generator which delivers the highest available coupling efficiency.

The 7500ce offers a no-compromise solution to the most difficult analytical challenges and is ready configured to meet strict environmental regulatory requirements including US EPA methods. The 7500ce's unmatched performance features include:

- Elimination of multiple polyatomic interferences on critical elements such as arsenic, selenium, chromium, vanadium and iron, without the need for highly reactive gases or expensive pre-mixed gas blends
- Interference removal without matrix matching, elementspecific optimization or interference equations
- High sensitivity and low oxides for the best performance even in the most difficult matrices
- Dynamic range from low-ppt for mercury, arsenic and selenium to 1000's of ppm for sodium (see Figure 1) in the same analytical run, thereby eliminating the need for additional analytical techniques, such as ICP-OES, GFAAS, cold vapor and atomic fluorescence.



Figure 1. Linear calibration for sodium from 50 ppb to 1180 ppm (1180 ppm represents the concentration of Na in 1:10 diluted full salinity seawater)

Simple Operation

Because the ORS uses simple cell gases (hydrogen and helium) for removal of interfering species, the 7500ce is much easier to set up and the interference removal capability is matrix independent, making it useful for routine trace analysis of complex, unknown sample matrices.



Figure 2. Efficiency of interference reduction in He mode. Comparison plots showing Std mode (no cell gas - red) and He mode (green) spike recovery data for 5ppb Cr in a variable matrix (up to 1% each of HCl, H_2SO_4 and Butanol). Potential interferences on ^{52}Cr include ArC, CIOH and SO.

Summary

Building on Agilent Technologies technical and applications knowledge in ICP-MS, the 7500ce is optimized to meet the demands of the routine trace metal analytical lab that require high performance from reliable, robust and simple to use instrumentation.

Novel design features, including the newly designed off-axis, high-transmission ORS, provide significantly improved sensitivity and detection limits, even in high matrix samples containing 100's - 1000's mg/L matrix elements.

The 7500ce offers unmatched detection power in the most challenging sample matrices found in the environmental industry. It is equally suited to the toughest analytical challenges found in the clinical, foods, nuclear, petrochemical, metals, pharmaceutical, forensic and geological industries.

For more information on the 7500ce visit the Agilent Technologies web site at: www.agilent.com/chem/icpms

Or visit Agilent's Environmental Industry web site at: www.agilent.com/chem/environmental



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