An inert desolvating nebulizer system for reduction of matrix-induced oxide interferences on rare earth elements, iridium, and platinum using quadrupole inductively coupled plasma mass spectrometry

FRED G. SMITH[1]*

[1]Teledyne CETAC Technologies, Omaha, Nebraska 68144 USA (*correspondence: fsmith@cetac.com)

This poster will examine the use of an inert low-flow desolvating nebulizer system for reduction of oxide mass spectral interferences that can occur in quadrupole inductively coupled plasma mass spectrometry (Q-ICP-MS). This nebulizer system uses an inert, low-flow nebulizer (100 microliters/min) coupled to an inert, heated membrane desolvator for efficient water vapor removal before sample aerosol injection to the Q-ICP-MS instrument. Water vapor from conventional nebulizer / spray chamber systems used with Q-ICP-MS can cause numerous mass spectral interferences. One general example is metal oxides formed from the combination of oxygen (from injected water) with sample matrix components. Two specific examples of metal oxide interferences will be investigated with and without membrane desolvation: Ba and Ce oxides on several low-mass rare earth elements (Sm, Eu, and Gd) and Hf oxides on iridium and platinum. Rare earth elements are critically important components of modern electronics (ex. magnets, lasers, cellular phones, computers) and iridium and platinum are widely used as chemical catalysts. Figures of merit for a conventional nebulizer / spray chamber and the inert desolvating nebulizer system will include operating conditions, interference intensities and reduction factors, background equivalent concentrations (BECs), instrument detection limits (IDLs), and limits of quantitation (LOQs).