Introduction

Collision/Reaction Cells (CRCs) are almost universally used in quadrupole ICP-MS, to remove spectral interferences that would otherwise bias results. Most cell designs operate with reactive cell gases or mixtures, but the 7700 Series (shown below) incorporates a new, 3rd generation cell, the ORS3, which provides effective interference removal in helium (He) collision mode.

The new cell operates effectively for multi-element analysis of complex and variable samples (as found in many analytical labs). Multi-element analysis of complex samples requires a cell gas which:

1) Is effective against many interferences, even when multiple interferences overlap each analyte mass (e.g. see table below)
2) Does not create any new interferences
3) Does not react with any analytes.

Results

Seven different sample matrices (plus a mix) were measured in no gas, H2 and He mode. The apparent concentration of 14 analytes was determined in each blank matrix, to quantify the level of interference on each analyte.

- Many interferences were present in no gas mode
- Many interferences remained and some new ones were created in H2 mode
- Consistent low blanks were obtained for all elements in He mode, indicating effective removal of all polyatomic interferences in all matrices.

Conclusions

The newly-developed 3rd generation collision/reaction cell (ORS3) of the 7700 Series ICP-MS provides effective removal of interferences in He mode (using an inert collision cell gas).

This is due to the narrow ion energy spread, high cell gas pressure, well-focused ion beam and large KED voltage step of the new ORS3.

The result is a high level of data integrity, due to the reduction of multiple interferences on multiple analytes, even in complex, unknown and variable sample matrices.