Sandia has developed an improved quadrupole mass spectrometer (QMS). The improvement lies in the substitution of the conventional hot filament electron source with a cold cathode field emitter array (FEA), which in turn, allows the operations of a small QMS at much higher internal pressures than are currently achievable. By eliminating the hot filament, problems such as the thermal “cracking of delicate analytes molecules, outgassing of a “hot” filament, high-power requirements, filament contamination by outgas species, and spurious electromagnetic fields are avoided altogether. In addition, the ability to produce FEAs using well-known and well-developed photolithographic techniques permits the building of a QMS that has multiple redundancies of the ionization source at very low additional cost.

TECHNICAL BENEFITS

- Low cost compared to other types of mass spectrometers
- Simple and reliable
- Relatively high pressure

INDUSTRIES & APPLICATIONS

- Real-time exhaust gas analysis for automotive applications
- Leak detection, residual gas analysis
- Thermal desorption mass spectroscopy
- Molecular beam analysis
- Environmental analysis for liquid and gas samples