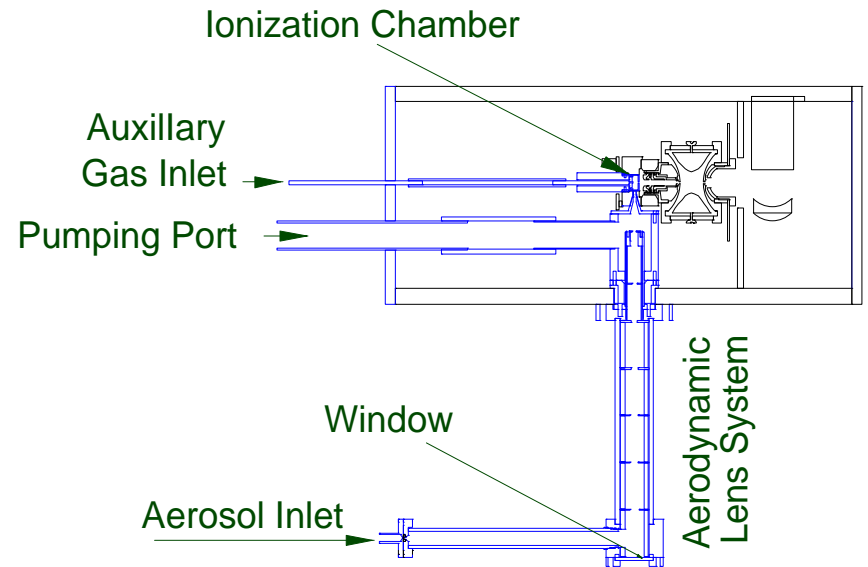


Mass Spectrometric Detection of Hazardous Particles

We have minimally modified a PolarisQ ion trap mass spectrometer for the real-time analysis of hazardous material containing aerosol particles. An aerodynamic lens inlet system collimates an aerosol from the atmosphere into a tight beam of particles that can be separated from its carrier gas and impacted into the ion volume of the analyzer where they are thermally vaporized and then ionized by glow discharge, electron impact or chemical ionization. The ions are then injected into the ion trap for subsequent mass analysis.

This instrument has been used to identify signature species from chemical weapons agent surrogates on house dust particles directly vacuumed from typical surfaces found in any office building. It can be used to identify explosives with high sensitivity. A single particle of explosive entering the inlet after vacuuming from a surface should provide ample signal for identification. We also envision the detection and identification of bacteria aerosols with this technique.



Modifications in Blue

Modification of a PolarisQ ion trap mass spectrometer for the analysis of hazardous material containing aerosols particles