AMS
Aerosol Mass Spectrometer Systems

Measure real-time, non-refractory, size-resolved particulate chemical composition and mass.

APPLICATIONS

• Climate change and air quality research.

• Organic aerosol quantification and analysis.
  - Separation and quantification of organic components including HOA (hydrocarbon-like organic aerosol, linked to primary combustion sources) and OOA (oxygenated organic aerosol, linked to secondary aerosol sources).
  - Elemental composition (O:C, H:C).

• Mobile measurements from ship, truck and aircraft platforms.

• Fast response plume studies up to 100 Hz.

• Aerosol chamber studies.

• Combustion exhaust monitoring and source characterization.

ADVANTAGES

• Particle beam source for efficient separation of gas and particle.

• Thermal particle vaporization with electron impact ionization source.

• Direct linear detection of sulfate, nitrate, ammonium, chloride and organic aerosol species.

• Fast response, up to 100 Hz mass spectra.

• Particle aerodynamic diameter determined from particle time-of-flight (velocity) measurements using a particle beam chopping technique.

• Several mass spectrometers to choose from: quadrupole, compact, and high resolution TOF systems.
### AMS Specifications:

**Detection Limit (S/N = 3) dependent on mass spectrometer option:**

<table>
<thead>
<tr>
<th>Mass Spectrometer System</th>
<th>Detection Limit* (ng/m³)</th>
<th>Mass Resolving Power (m/Δm) (m/z)</th>
<th>Mass Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>C-ToF-AMS</td>
<td>1.2</td>
<td>800</td>
<td>1-1000</td>
</tr>
<tr>
<td>HR-ToF-AMS: (V-mode)</td>
<td>2.9</td>
<td>2500</td>
<td>1-1200</td>
</tr>
<tr>
<td>: (W-mode)</td>
<td>32</td>
<td>5000</td>
<td>1-1200</td>
</tr>
</tbody>
</table>

*Detection limits are for 1-minute integration, 3σ. Detection limits depend on chemical species. Typical values for nitrate are listed (organic DL is ~10x higher, sulfate DL is ~2x higher and ammonium DL is ~20x higher).

**Particle Size Range:**

40-1000 nm aerodynamic diameter standard or PM 2.5 option

**Data Rate:**

1-5 minute typical data reporting interval. Maximum mass spectra data rate 100 Hz (ToF MS systems only). Maximum size distribution data rate 150 Hz.

**Data Format:**

Custom acquisition and analysis software for mass loadings and size distributions. Specialized routines for high resolution data analysis (O:C ratios)

**Sample Flow:**

0.085 l min⁻¹

**Available Options:**

Black carbon detection module, PM 2.5 lens, beam width probe, efficient particle time-of-flight (ePTOF), aerosol dryer, sample line flow controller

**Size/Weight:**

41” x 24” x 53”, 385 lbs

[104.14 cm x 83.82 cm x 134.62 cm, 175 kg]

**Electric Power:**

600 W; 110VAC/60Hz or 220VAC/50Hz

### References


