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Direct Sampling Ion Trap Mass Spectrometry (DSITMS) and Long Term Environmental Monitoring

What is DSITMS?

DSITMS is a field portable mass spectrometric systems that can provided rapid (<5 min.) analysis of contaminants in air, water and soil.



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A Short History of DSITMS

- 1976 ■ NASA Viking II Lander Mission to Mars
- 1980s ↓ DoD funded ORNL for Mobile Chemical agent detectors
AEC funded ORNL for DSITMS environmental applications
- 1990s ↓ DoD/EM 50 funded ORNL for DSITMS environmental applications
DoD/DoE/USDA/others funded ORNL DSITMS research
- 1995 ↓ WES/ORNL developed DSITMS SCAPS applications
- 1995 ↓ AEC/DARPA funded Tech. Reinvestment Program – ORNL, WES, Teledyne, others
- 1997 ↓ CBDCOM/ORNL Chem Bio MS Block II
- 2000 ↓ ORNL licensed DSITMS to Tri-Corders Env., Inc. for commercialization

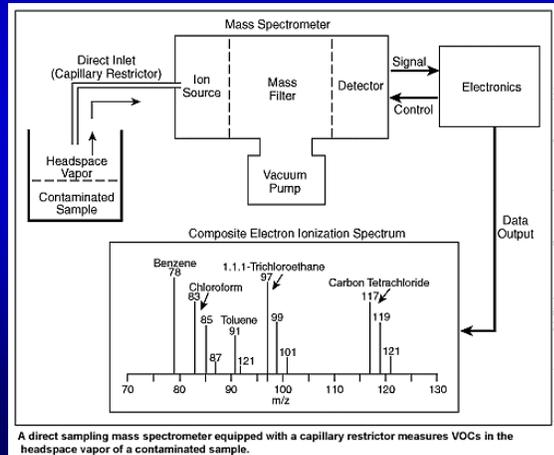
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How does DSITMS work?



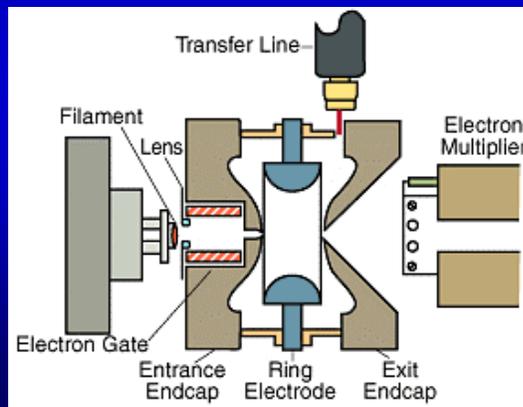
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Ion Trap Mass Spectrometry



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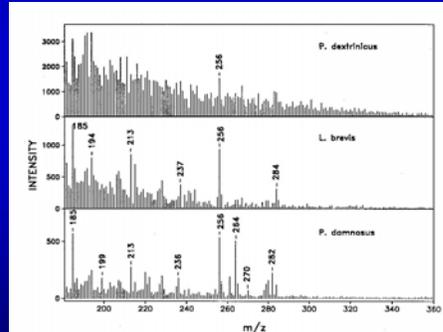


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6.2 Long Term Monitoring Research Opportunities for DSITMS

1. Semi-volatile contaminants
PCBs, PAH, Dioxins, etc.
2. Explosives and energetics
Nitrotoluenes and nitramines (?)
3. Infectious agents in air and water



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Attributes:

- Low cost
- Field-portable
- Rapid
- Little/No wet chemistry
- Continuous process monitoring/optimization
- GIS compatible
- EPA Volatiles standard method
- Searchable spectra

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Benefits

- Direct:
 - Rapid, cost-effective generation of high-resolution maps of contaminants.
 - Near real-time, on-line monitoring.
 - Enables evaluation of environmental restoration.
 - Compliments ARAMS.
- Indirect:
 - Increase return on “sunk” capital (i.e., existing wells).
 - Enabling technology that can rapidly increase a critical environmental knowledge base.
 - Increases the productivity of remediation while reducing environmental risk.

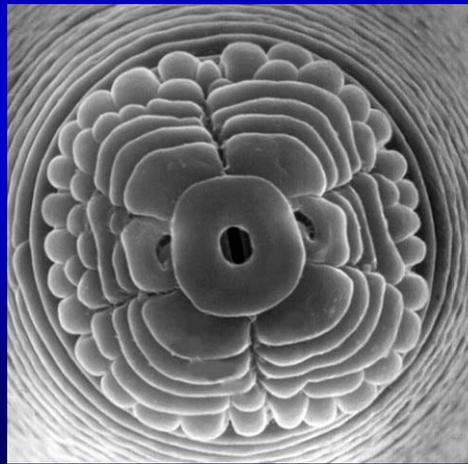
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Questions



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