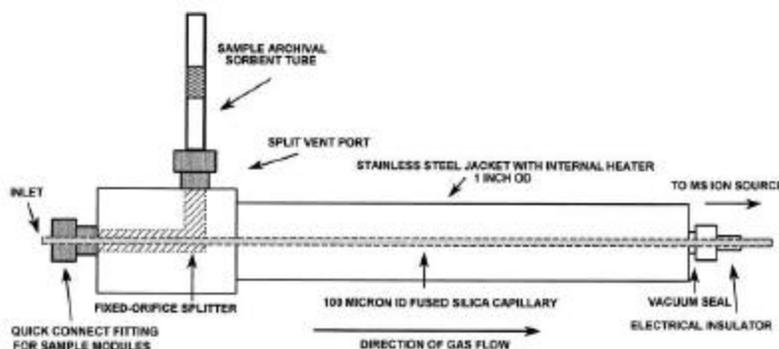


Direct Sampling Ion Trap Mass Spectrometry (DSITMS) TechID 69

Direct Sampling Ion Trap Mass Spectrometry (DSITMS) introduces sample materials directly into an ion trap mass spectrometer by means of a very simple interface, such as a capillary restrictor or a polymer membrane, with little if any sample preparation and no chromatographic separation of sample constituents. Target analytes include Volatile Organic Constituents (VOCs) and selected SemiVolatile Organic Constituents (SVOCs). Instrument analysis is nearly instantaneous; analyses are typically completed in less than five minutes at cost typically less than half that of standard EPA Method analyses performed in commercial laboratories. DSITMS can be used in conjunction with Cone Penetrometer sampling methods. It is particularly useful for field screening of VOCs and for monitoring remediation efforts for VOCs of concern known to be present.



Developers:

- Oak Ridge National Laboratory.
- U.S. Army Waterways Experiment Station.

Applications:

- Used with Cone Penetrometer and Hydropunch for rapid characterization of VOC plume (Aberdeen Proving Ground, 1995).
- Used to delineate VOC concentration as function of depth (Oak Ridge 1996).
- Numerous applications in VOC plume characterizations, both for providing analytical results and for guiding placement of new wells.
- Can also be used in Continuous Emissions Monitoring (CEM) for VOCs/SVOCs at thermal treatment facilities.

Benefits:

- Greatly reduces number of off-site laboratory analyses required, saving at least half the cost for each analysis.
- Allows near-real-time evaluation of VOC/SVOC concentrations in groundwater or soil, allowing prompt determination of subsequent sampling points.
- Detection limits are comparable with those of standard EPA Methods; however, since no GC step is involved, analyte identification is more limited. Hence DSITMS is best used for small set of known constituents.

Status:

- Available through ORNL (guerinmr@ornl.gov or wisemb@ornl.gov).
- Vendor has obtained license, should be commercially available in near future
- Regulatory acceptability for specific application must be ascertained.