SAND2011-2953C

# *In Situ* Detection of Toxic Chemicals in Air and Analysis of Ambient Surfaces by Mass Spectrometry

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## Abstract

The development of miniaturized instrumentation that can rapidly detect, identify, and quantitate chemical and biological species *in situ* for applications such as facility air monitoring and explosives detection is of increasing interest to the defense sector and department of homeland security. Mass spectrometers are known for their powerful combination of speed, sensitivity, versatility, and high throughput. As a result, work has been conducted in recent years to miniaturize these systems so that they can be used *in situ*. The analytical capabilities of miniature ion trap mass spectrometers[1] equipped with electron ionization as well as several types of sample introduction systems developed at Purdue University and ICx Analytical Instruments were investigated. Novel, upcoming work at Sandia National Laboratories will focus on the detection and identification of existing and new chemical signatures of home-made explosives (HME) on ambient surfaces using desorption electrospray ionization (DESI)[2] and the recently installed Waters SYNAPT G2 HDMS instrument.

## Acknowledgments

Sandia National Laboratories is a multi-program laboratory operated by Sandia Corporation, a wholly owned subsidiary of Lockheed Martin Corporation, for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000. All data prepared, analyzed and presented have been developed in a specific context of work and were prepared for internal evaluation and use pursuant to that work authorized under the referenced contract. Reference herein to any specific commercial product, process or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof.

## References

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(2) Z. Takats, J.M. Wiseman, B. Gologan and R.G. Cooks, *Science*, 2004, **306**, 471.