World's smallest hand-held instrument for detecting health and safety threats

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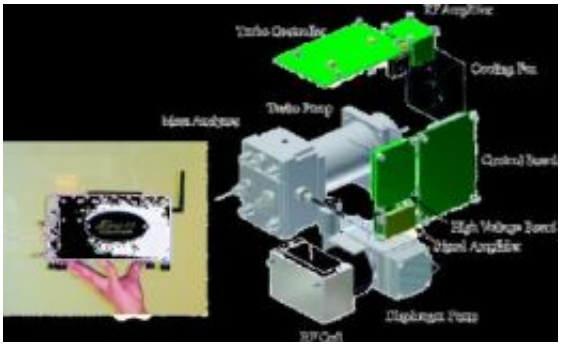

Chemists have developed the world's smallest mass spectrometer, the Mini 11, which could be used to detect hidden explosives or bioterrorism agents. Credit: American Chemical Society

Researchers in Indiana are describing development of the world's smallest complete mass spectrometer (MS), a miniature version of a standard lab device — some of which would dominate a living room — to identify tiny amounts of chemicals in the environment. The hand-held MS, about the size of a shoebox, could speed the detection of bioterrorism agents, hidden explosives, and other threats, the researchers say. Their study is scheduled for the current issue of ACS' *Analytical Chemistry*.

R. Graham Cooks, Zheng Ouyang, and colleagues note that scientists have developed several different versions of portable mass spectrometers over the past few decades. However, the instruments' large size, weight,

and inability to analyze a wide variety of different target molecules have limited their practical use.

The scientists responded to the need for a small but sensitive MS by developing the Mini 11. About the size of a small shoebox, it weighs only 9 pounds (half the weight of other portable MSs), and can be operated by remote control. Laboratory tests showed that the Mini 11 could accurately identify the chemical composition of three commonly used commercial drugs within just one minute using tandem mass spectrometry. Unlike previous portable mass specs, this new instrument is capable of analyzing a wider variety of molecules, including large proteins, the scientists say.

Article: "Design and Characterization of a Multisource Hand-Held Tandem Mass Spectrometer" dx.doi.org/10.1021/ac801275x

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