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Mini 11, the mass spectrometer that could prevent safety threats
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Mini 11, World's Smallest Explosive or Bio-Terrorism Detector

The device is a fully-functional hand-held mass spectrometer

The analytical technique of mass spectrometry allows the identification of the chemical composition of a sample or of a compound based on the mass-to-charge ratio of its charged particles (ions). This ratio of the particles is observed via passing them through the electric and magnetic fields of a mass spectrometer (MS). Typical modern MS could easily fill a regular room due to their size. But a group of scientists from Indiana have recently developed a miniature fully-functional version that could be held in one's hand.

They claim that their tiny version of a regular laboratory device is the smallest of its kind ever created and it can be used to trace small amounts of chemicals in the surroundings. R. Graham Cooks, Zheng Ouyang and their team call the invention Mini 11. It is the size of a shoe box, weighing about 9 pounds (4 kg), half the weight of its closest competitor, and it is able to detect threats to human safety, such as bio-terrorism agents or concealed explosive materials. This finally brings MS to public use, such as in airports or other buildings where security is highly important. The Mini 11 mass spectrometer device can be operated by means of a remote control, if necessary, making it even more suitable for dangerous tasks. The results of the hand-held tool testing phase indicated that it is able to precisely detect the chemical composition of three of the most known and widely used hallucinogen substances in as little as a minute, by relying on its tandem mass spectrometry technology. Also, by comparison with other similar devices, the Mini 11 portable MS can successfully and accurately analyze a larger range of molecules, such as large proteins, according to its developers.