Exceptional service in the national interest



MicroChemLab

The MicroChemLab is a handheld chemical analysis system that combines sample handling, separation, and detection. MicroChemLab combines three cascaded stages; each realized using microfabricated components.

The discrimination power of analytical chemistry techniques may one day be realized with microanalytical systems that combine sensors with means for collecting samples, preconcentrating them, and separating constituent species for identification and quantification. Work is underway to construct on-chip building blocks for these systems, including pumps, valves, preconcentrators, gas-chromatograph columns, and sensors.

- Stage one collects and concentrates samples.
- Stage two is a gas chromatography (GC) column used to achieve sample separations.
- **Stage three** is an array of surface acoustic wave (SAW) sensors used to detect the sample.



Figure 1. Stages of chemical analysis system.

Overview

- Microanalytical systems combine sensor(s), sample handling, and species separation on a chip
- Micromachined gas chromatograph column separates gas-phase analytes

Applications

- Explosive detection
- DNA Sequencing
- Chemical and biological weapon detection (NN)



Figure 2.







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