

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 micro-analytical 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.

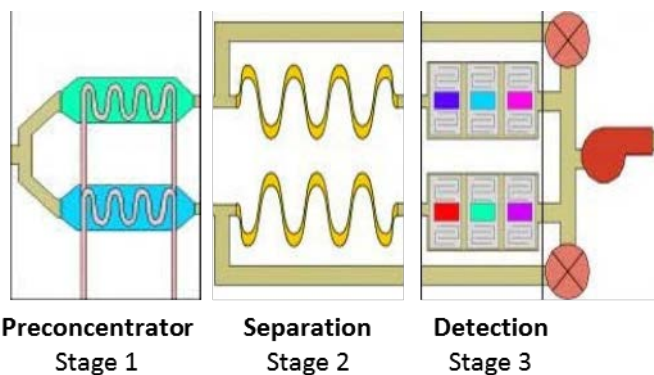


Figure 1. Stages of chemical analysis system.

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)

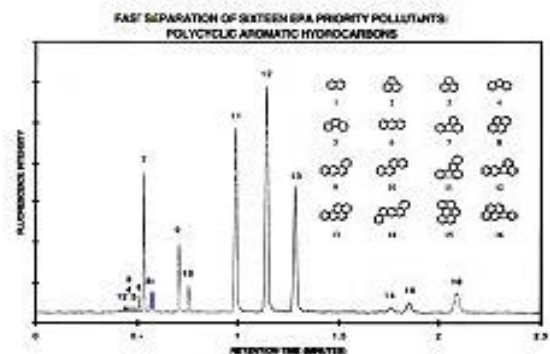


Figure 2.

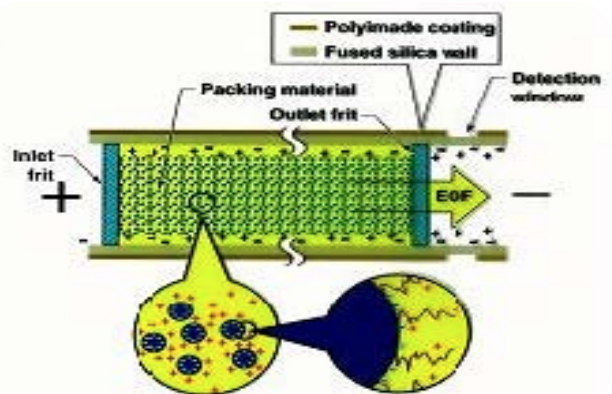


Figure 3.