Conventional metal-oxide semiconductor field-effect transistor (MOSFET) technology consists of a source, drain, gate, and substrate. The chemical field-effect transistor (chemFET) is a type of a field-effect transistor acting as a chemical sensor, and is similar to MOSFET except for the gate structures. Modern industrial players seek higher-sensitivity technologies which are small, durable, efficient, and versatile. Further advances in these materials and structures could enable many new kinds of layered semiconductors and devices. To address need, researchers at the University of California, Berkeley, have developed chemical-sensitive field-effect transistor (CS-FET) platform technology. By exploiting selective thin films incorporated into the CS-FET, researchers have created chemical sensors with commercial promise in terms of chemical-versatility and low-power.

**SUGGESTED USES**

- Chemical sensing and analysis
- Gas sensing and analysis
- Environmental monitoring

**ADVANTAGES**

- Smaller footprint than conventional chemFET
- High sensitivity
- Leverages industry standard platforms and low-cost parts

**RELATED MATERIALS**

**CONTACT**

Laleh Shayesteh
lalehs@berkeley.edu
tel: 510-642-4537.

**INVENTORS**

Javey, Ali

**OTHER INFORMATION**

**KEYWORDS**

metal oxide semiconductor field effect transistor, MOSFET, chemical field effect transistor, chemFET, chemical sensitive field effect transistor, CS-FET, chemical sensor, sensor, layered semiconductor, multi-gas, gas sensor, lab-on-chip

**CATEGORIZED AS**

- Environment
- Sensing
- Semiconductors
- Design and Fabrication
- Sensors & Instrumentation
- Environmental Sensors
- Process Control
- Scientific/Research

**RELATED CASES**

2014-191-0

**ADDITIONAL TECHNOLOGIES BY THESE INVENTORS**

- Enhancing Photoluminescence Quantum Yield for High Performance Optoelectrics
- A Thin Film VIs Semiconductor Growth Process