



Ultrasensitive Nitrogen Dioxide Gas Sensor Based On Iron Nanocubes

Applications

- Gas sensor

Problem & Solution

The use of gas nano-sensors has recently attracted significant interest in industrial and environmental applications. In particular, nitrogen dioxides can be used as a potential indicator for pollution detection. However, fabrication of these nano-sensors is not compatible with complementary metal-oxide silicon (CMOS) technology, and thus, miniaturization cannot be fully realized.

An ultrasensitive nitrogen dioxide gas sensor based on a porous film of iron nanocubes has been developed. Well-defined iron nanoparticles with controlled size and shape were deposited on gold electrodes using CMOS compatible technology. These iron nanocubes undergo electrical changes when exposed to nitrogen dioxide which enables detection.

Benefits

- Miniaturized nitrogen dioxide gas sensor
- Low cost thin film allows detection of very low concentrations (ppb level) of NO₂ gas.
- CMOS (complementary metal-oxide silicon) compatible method.

Patent Pending

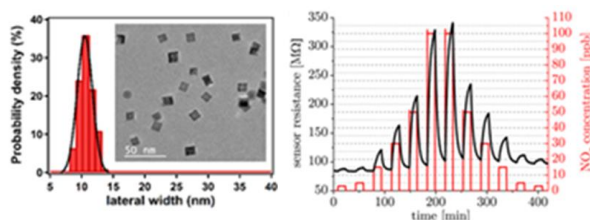
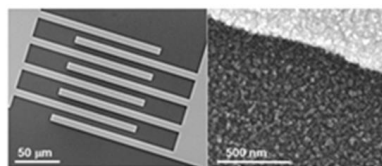
Keywords

NO₂ gas sensor, Fe nanocubes, nanomaterials, semiconductor devices

For more information

Business Development/Technology Licensing Section

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(Top) SEM image of the electrode device covered with a percolating film of Fe nanocubes; (Left) TEM image showing the Fe nanocubes with their corresponding size distribution; (Right) Resistance change of the gas sensor during exposure to ppb-level NO₂