



# Acetone Nanosensor

## Applications

- Portable blood glucose monitoring device
- Environmental monitoring device

## Problem & Solution

The acetone level in exhaled breath is known to change in correlation with blood glucose level. Therefore, ppb-level acetone sensors have the potential to offer non-invasive means for the screening of diabetic patients and evaluating the progress of diabetes. However, current commercially available acetone sensors are not sensitive enough to detect ppb-levels of acetone.

A CMOS friendly acetone sensor based on ruthenium nanoparticle decorated copper oxide nanowire has been developed. Once copper is electron-beam deposited on a silicon substrate, nanowires are grown through thermal oxidation. Subsequently, the surface of the nanowires are partially covered with ruthenium nanoparticles via gas-condensation. These nanowires undergo electrical changes when exposed to acetone which enables detection.

## Benefits

- Compact acetone sensor
- Measurement of very low concentrations (ppb level) of acetone
- CMOS compatible fabrication method

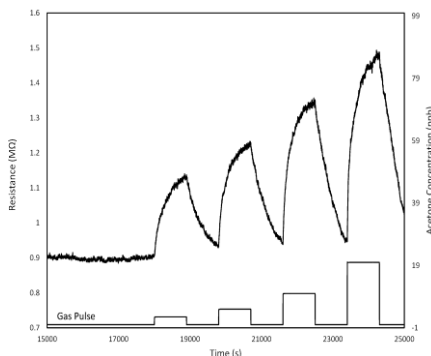
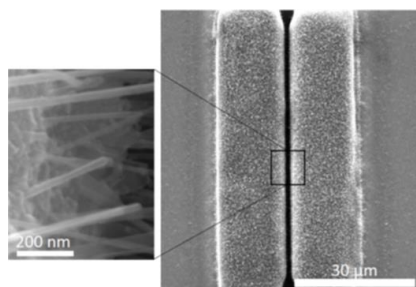
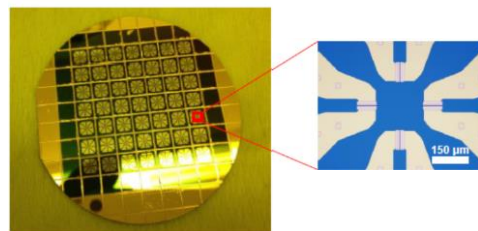
## Patent Pending

## Keywords

Acetone sensor, diabetes, breath gas metabolites, ruthenium, nanowire, copper oxide, nanomaterials, semiconductor devices, pollution

## For more information

Business Development/Technology Licensing Section  
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(Top) Wafer scale fabrication of devices with four acetone sensors each consisting of two gold electrodes bridged by CuO nanowires (Middle) CuO nanowires decorated with Ru nanoparticles (Bottom) The resistance response of ruthenium decorated CuO nanowires to acetone at operating temperatures of 250° C.