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AMPLIFIED CHEMO-MECHANICAL COMB GAS SENSORS

HARDWARE, CIRCUITS, & SENSORS

Interdigitated fingered chemicapacitor sensor for detection of volatile organic compounds (VOCs).

TECHNOLOGY TYPE

Gas Sensors
Microsensor
Chemicapacitor
Electrodes

STAGE OF DEVELOPMENT

- Initial testing indicates the device is 100x more sensitive than conventional chemicapacitors.

- Ongoing research to optimize design.

IP PROTECTION

Nationalized PCT Pending in the United States

Laterally Actuated Amplified Capacitive Vapor Sensor
WO2018081735A1

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Reference Number: U-6063

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TECHNOLOGY SUMMARY

Conventional capacitive vapor sensors (chemicapacitors) measure gas concentration by observing changes in capacitance between fixed conductive electrodes. Chemicapacitive sensors are robust devices, but cannot detect water vapor concentration corresponding to less than 2% relative humidity.

The proposed technology is a highly-sensitive chemicapacitor with a vapor absorbing layer. The layer absorbs volatile organic compounds, which increases stress on the interdigitated fingered capacitor and causes the fingers to bend. As the absorption layer approaches the other finger, an electrical signal is produced. This sensitivity-increasing method is compatible with pre-existing chemicapacitive sensors, making its potential applications widespread.

FEATURES AND BENEFITS

- Increases device capacitance.
- Enhances sensitivity by 100x over that of conventional chemicapacitors.
- Demonstrates potential for use in air quality VOC sensors and breathalyzers.
- Integrates with pre-existing chemicapacitors.

RECENT PUBLICATIONS

Likhite, R., Pandey, S.S., Banerjee, A., Kim, H., Mastrangelo, C.H. (2016). Amplified chemomechanical comb gas sensor. *2016 IEEE Sensors*. doi: [10.1109/icsens.2016.7808784](https://doi.org/10.1109/icsens.2016.7808784)

INVENTOR PROFILE

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DATE UPDATED: 7/25/2019