



Miniaturized Sensor for efficient Control of Air Quality

HFU, IPM, IMTEK (Germany)

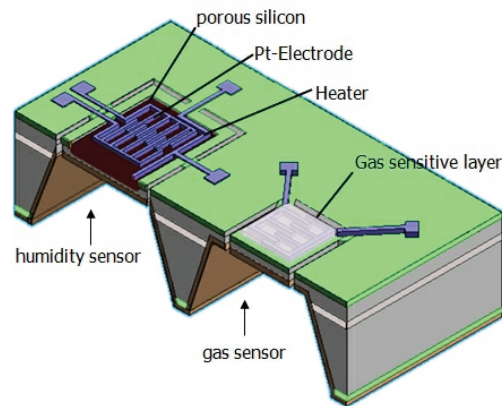


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BACKGROUND and BASICS

- Quantitative measurement of the environmental air quality with a sensor array integrated on a single chip
 - Gas sensor: SnO₂ sensitive layer, resistivity measurement
 - Humidity sensor: Porous silicon, impedance measurement
 - Hotplate: SOI technology
 - Signal processing: novel model based signal analysis



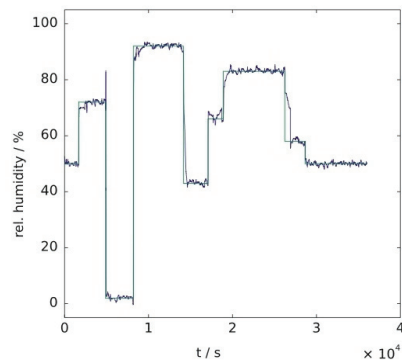
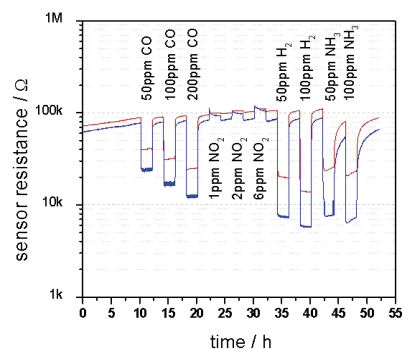
- **Applications:** Air conditioning in cars and buildings

CONCEPT and SOLUTION

- A porous silicon based humidity sensor and two SnO₂ gas sensors are separately located on three different thermal isolated hotplates

Benefits:

- Gas sensor: Good selectivity and sensitivity, fast response time
- Humidity sensor: Good sensitivity even at low humidity levels, low hysteresis even without heating
- Hotplate: Fast temperature profiles, different working temperatures for humidity and gas sensor, low power consumption
- Signal processing: Temperature modulation and corresponding estimation of gas concentration and relative humidity by means of Sigma-Point Kalman filters



STATUS and OUTLOOK

- Actual status:
 - Working demonstrators have been fabricated
 - Characterizations in laboratory and different rooms in an apartment have been done
 - Yield has to be increased before series production
 - Optimization to special application is possible
- We are looking for companies which are interested in commercialization of the results. At a first step an activity of prototyping (small volume) is suggested.



Contact

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MICROTECHNOLOGY 2009