

Precise photoacoustic gas sensor

Compensates for disruptive effects

Invention

The quantitative verification of specific gases in a mixture is technically challenging, so microsystemic sensors often return large measurement errors. A new miniaturized photoacoustic gas sensor from the Technical University of Dortmund can help by detecting target gases very precisely and selectively. A gas sample is radiated from a pulsed light source of suitable

wavelength, heating the gas molecules to the proper absorption band.

Thermal expansion generates compression waves that can be detected with sound-sensitive elements. The signal amplitude indicates the gas concentration to be detected. This method can verify all gases with absorption in the IR range (carbon dioxide, methane, etc.).

The photoacoustic gas sensor's fundamental principle is described in the earlier Technology Offer 6128. The new



Application idea

feature of this sensor is that disrupting influences such as temperature fluctuations and changes to light source intensity are automatically compensated for. Measurement is much more accurate because of the reduction in disruptive factors, making the photoacoustic gas sensor more stable and reliable.

Commercial Opportunities

The micro-integrated design allows this gas sensor to be used in very compact devices. It can be deployed wherever fast, precise determination of gas concentration is needed, and the measured values can be stored on a compact device. The technology allows integration into such devices as smartphones. The sensor can be used in carbon monoxide warning devices and in air-quality-monitoring units that measure carbon dioxide concentration in rooms. It can also be used to document leaks in systems driven with sulfur hexafluoride, an insulating gas that damages the climate.

Current Status

The sensor is based on the earlier European Patent Application EP21212050.5. A German patent application was then submitted for the new features. The invention can be registered in other countries in the priority year or with a later PCT application. We are offering interested companies the opportunity to license and, especially, refine the technology in collaboration with the inventors and the Technical University of Dortmund.

An invention from TU Dortmund University.

Competitive Advantages

- Miniaturized gas sensor
- Improved measurement accuracy
- Wide field of application

Technology Readiness Level

1 2 3 4 5 6 7 8 9

Basic principles observed

Industries

- Electronics
- Sensors

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6739 (see also 6128)

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