

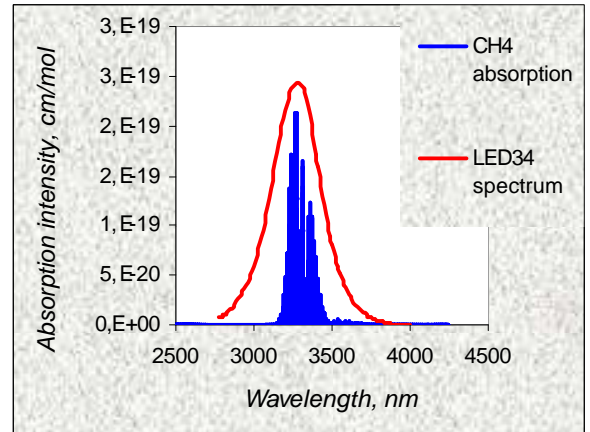
# APPLICATION in Gas Sensors

## Application of Mid-Infrared LED and Photodiodes in Gas Sensors

### General information

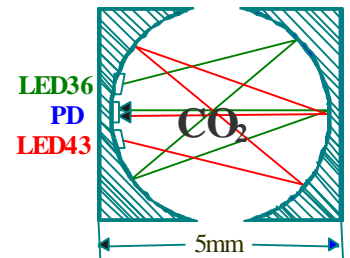
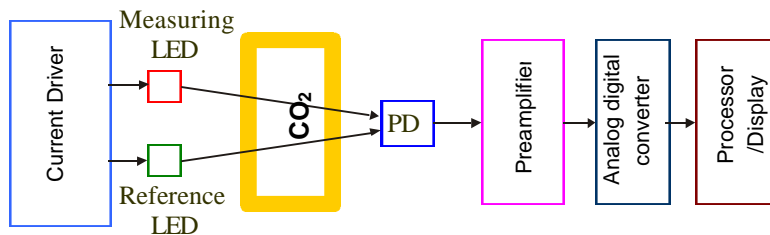
The main principle of mid infrared gas spectroscopy is very simple:

• Many important gases and liquids have strong absorption lines in mid infrared spectral range. Different materials have different absorption spectra. Radiation from the source passes through the sample cell. The radiation not absorbed by the sample is then detected and the ratio of this to the incident provides a measure of the concentration of target gas in the sample. A second channel tuned to a different wavelength that is not attenuated by any species likely to be present in the sample is normally used to provide this reference measurement.



But up to now wide application of portable gas sensors is limited by imperfections of currently used heating infrared sources (lamps) with filters. They have poor spectral efficiency, low operation speed, large sensor size because of complicated optical scheme and high heat dissipation.

Now we can offer a **NEW** mid infrared sources for gas sensors- **Mid-IR LEDs**. We cover all spectral range **1.6-5.0  $\mu\text{m}$** . This light source is much smaller, high speed, with low power consumption and don't need filters.



List of some gases that have absorption lines in mid infrared range:

<b>CH<sub>4</sub></b> 3.2÷3.45 $\mu\text{m}$	<b>HCl</b> 3.33÷3.7 $\mu\text{m}$	<b>H<sub>2</sub>O</b> 2.5÷2.8; 1.8-1.9 $\mu\text{m}$	<b>N<sub>2</sub></b> 4.0÷4.54 $\mu\text{m}$
<b>C<sub>2</sub>H<sub>2</sub></b> 2.99÷3.09 $\mu\text{m}$	<b>HOCl</b> 2.6÷2.9 $\mu\text{m}$	<b>CO<sub>2</sub></b> 4.2÷4.3 $\mu\text{m}$	<b>NH<sub>3</sub></b> 2.27; 2.94 $\mu\text{m}$
<b>C<sub>2</sub>H<sub>4</sub></b> 3.1÷3.4 $\mu\text{m}$	<b>HBr</b> 3.7÷4.0 $\mu\text{m}$	<b>OH<sup>-</sup></b> 2.38÷2.63 $\mu\text{m}$	<b>NO<sup>+</sup></b> 4.08÷4.44 $\mu\text{m}$
<b>C<sub>2</sub>H<sub>6</sub></b> 3.3 $\mu\text{m}$	<b>HI</b> 2.27÷2.3 $\mu\text{m}$	<b>H<sub>2</sub>CO</b> 3.38÷3.7 $\mu\text{m}$	<b>HNO<sub>3</sub></b> 5.74÷5.98 $\mu\text{m}$
<b>CH<sub>3</sub>Cl</b> 3.22÷3.38 $\mu\text{m}$	<b>H<sub>2</sub>S</b> 3.7÷4.4; 2.5-2.8 $\mu\text{m}$	<b>CO</b> 4.4÷4.8 $\mu\text{m}$	<b>NO<sub>2</sub></b> 3.4 $\mu\text{m}$
<b>OCS</b> 3.45; 4.87 $\mu\text{m}$	<b>HCN</b> 2.94÷3.1 $\mu\text{m}$	<b>HO<sub>2</sub></b> 2.73÷3.1 $\mu\text{m}$	<b>SO<sub>2</sub></b> 4.0 $\mu\text{m}$