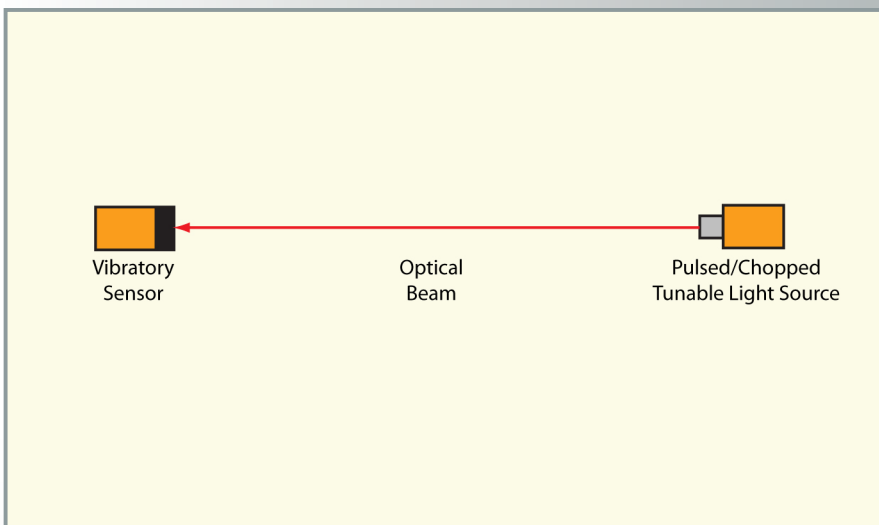


Photoacoustic Point Spectroscopy

UT-B ID 200802137



Advantages

- Increased range and sensitivity
- Compact size

Potential Applications

- Open environment photoacoustic spectroscopy
- Molecular analysis

Patent

Charles W. Van Neste, Lawrence R. Senesac, and Thomas G. Thundat, *Photoacoustic Point Spectroscopy*, U.S. Patent Application 12/189,652, filed August 11, 2008.

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Technology Summary

ORNL researchers invented a detector that uses photoacoustic waves to excite a vibratory sensor coated with unknown molecules. This invention can be used to identify these molecules and study solid, gas, or liquid samples.

The device is an advance over other photoacoustic spectroscopy techniques, because it uses a vibratory sensor instead of a resonant chamber and microphone. This approach is effective in an open environment and also increases the sensitivity of detection.

To identify the molecules, pulsed/chopped light is shown on a sensor. Acoustic waves are produced at the light's frequency, mechanically oscillating the vibratory sensor. As the molecules absorb or reflect the impelling light, the amplitude of the acoustic waves and the vibrating sensor increases or decreases. Identification of the molecule is based on the vibrational amplitude of the sensor versus optical wavelength.

 PARTNERSHIPS