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Battelle Number(s):

11714, 11715, 11846, 11847

Patent(s) Issued

Available for licensing in all fields

Available Technologies

Enhanced Photoacoustic Detection Including that of Optically Dense Samples

SUMMARY

Photoacoustic spectroscopy is a versatile and highly sensitive pulsed-light absorption-spectroscopic technique for analytic, kinetic, and calorimetric analyses. Photoacoustic spectroscopy involves the absorption of a pulse of light energy by a molecule and the subsequent detection of a pressure wave generated by heat energy released by the molecule upon its return to the ground state. Photoacoustic spectroscopy analysis is (i) Nondestructive, (ii) Real-time, and (iii) 10 to 1000 times more sensitive than conventional UV-Vis spectroscopy.

A suite of photoacoustic sensor technologies developed at the Pacific Northwest National Laboratory significantly improves the real world applicability of existing photoacoustic spectroscopy technologies:

- * Allows analysis of suspensions, as well as dilute or optically dense solutions.
- * Provides for nondestructive, real-time chemical monitoring of complex mixtures.
- * Enables microliter and nanoliter sample volumes with wide range of wavelengths.
- * Enables the design of low cost, small and rugged instruments.
- * Permits continuous monitoring of constituents in solutions without the need to dilute samples, thus allowing analysis of mixtures in situ, under real-life conditions, and if needed, in-line.
- * Extends the range of concentrations that can be analyzed while retaining sensitivity at concentrations considerably lower than conventional UV-Vis and IR spectroscopy.
- * Reduces the time needed for handling samples (there is often no need for extractions or dilutions), and therefore the cost of routine analysis.



Patents & Intellectual Property

- » Patent #: 6,236,455
- » Patent #: 6,244,101
- » Patent #: 6,729,185
- » Patent #: 6,870,626
- » Patent #: 6,873,415
- » Patent #: 6,999,174

Technology Portfolio(s)

- » Monitoring
- » Other
- » Chemical Sensors

Potential Industry Applications

- » Computers & Electronics

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