

# PHOTOCATALYTIC MATERIAL TESTING

## THE OPPORTUNITY

Photocatalytic materials have multiple applications which consist for the majority in catalyzing value-added physico-chemical processes. These processes usually involve a gas reaction, catalyzed on a solid substrate that is activated by daylight and, typically, absorption of UV irradiation.

Among different interesting applications, embedding photocatalytic compounds in building materials enables large scale deployment of distributed and passive air cleaning solutions in the polluted urban environment. Indeed, when exposed to the sunlight, a photocatalytic building envelope can decompose volatile organic compounds (VOC) – eg. toluene, acetaldehyde – into harmless  $\text{CO}_2$  and  $\text{H}_2\text{O}$ .

Because photocatalysis is a complex process involving many aspects of physics and chemistry, and although computer modeling exists to predict the photocatalytic performance of various compositions of advanced materials, the specialists still rely on the generation and analysis of extensive experimental data to study and understand the multiple factors that contribute.

On the gas side of the photocatalytic process, studying the kinetic of reaction and the efficiency of a photocatalytic process requires to monitor the concentration reactants and the products with high accuracy and repeatability. Low detection limits, high sensitivity and wide dynamic range are needed to monitor the full span of the photocatalytic reaction.



## OUR SOLUTION

Advanced Energy's photoacoustic gas monitor, the Innova 1512, is a very relevant instrument with regard to the measurement needs met by photocatalysis scientists. Research teams throughout the world select it because of the following features:

- Multi-gas instrument enabling the monitoring of reactants and products with a unique instrument
- High versatility and easy customization: the selection of gases of interest is made simply by choosing the appropriate optical gas filters
- Embedded pump and very low sampling volume: the gas monitor can be integrated in a closed-loop configuration with a small-size reactor

## YOUR BENEFITS

- High sensitivity and wide dynamic range resulting from the unique properties of the photoacoustic detection principle and an optimum sensor design
- Direct measurement, online monitoring
- Easy to use without need of advanced skills in analytical instrumentation
- User friendly interface and powerful application software
- Low cost of ownership: few maintenance needs, no carrier gas needed



Advanced Energy's Innova 1512



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### PRECISION | POWER | PERFORMANCE

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