



## TECHNOLOGY

# Infrared Spectroscopy Chamber for Environmentally Sensitive and Rough Materials

## OVERVIEW

### Background:

Spectroscopy, which involves the study of the electromagnetic interaction with matter, is a multibillion dollar market which is expected globally to reach 15.6 billion dollars in 2020 at a compounded annual growth rate of 3%. Market trends in this area are as a result of the increase in the development of next generation analysis tools that can analyze samples with higher precision. Spectroscopic instruments measure the reflection or the absorption properties of a material as a function of wavelength covering the UV to IR region of the electromagnetic spectrum. The sensitivity and precision of these measurements are highly dependent upon the optical components and material properties of the sample chambers within the spectrophotometer. Strong background signals associated with these two factors pose a challenge and can obscure significantly weakly generated signal from samples of interest. Furthermore, optical characteristics of rough or environmentally sensitive samples change during measurement, complicating the analysis of many materials.

### Innovative Technology:

Researchers from the University of Maryland have developed environmental sample chamber that can be used under different environmental conditions to enable in-situ optical measurements with minimum attenuation of signal from the sample. Chambers are compatible with standard sample holders for optical instruments under various optical characterization conditions. In addition, for samples with rough surface areas susceptible to signal loss due to scattering, a novel calibration method for the optical measurements has been developed to exclude the scattering effects of sample surface roughness. The resulting measurements observed demonstrate increased sensitivity and precision offered by this method.

### Benefits

- Use of various environmental conditions during optical measurements
- Samples can be used in their native form
- Increased sensitivity and precision due to the calibration method
- Applicable to most spectroscopy instruments

### Applications

- FTIR spectrometers
- Integrated sphere measurement
- Optical Microscopes
- Confocal Microscopes
- Florescent Spectrometers

Optical Spectrophotometers

## **CONTACT INFO**

UM Ventures

0134 Lee Building

7809 Regents Drive

College Park, MD 20742

Email: [umdtechtransfer@umd.edu](mailto:umdtechtransfer@umd.edu)

Phone: (301) 405-3947 | Fax: (301) 314-9502

## **Additional Information**

### **INSTITUTION**

University of Maryland, College Park

### **PATENT STATUS**

Pending

### **EXTERNAL RESOURCES**

PS-2019-004