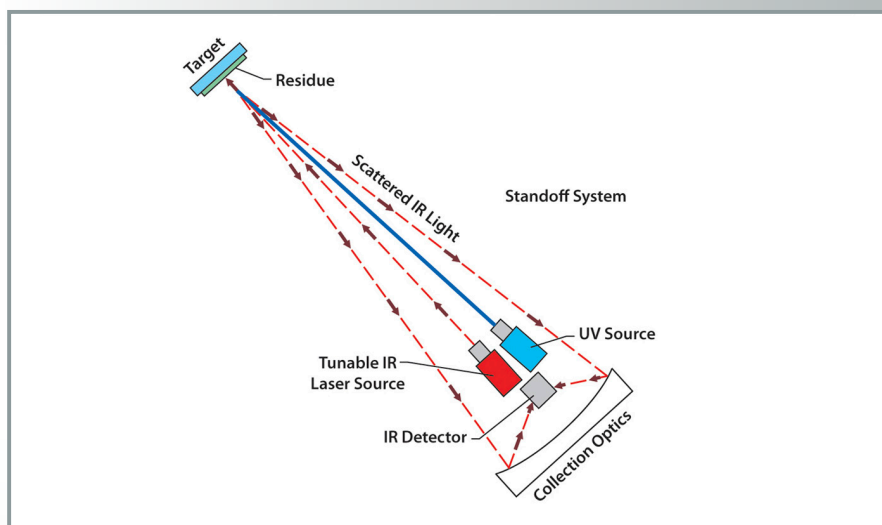


Standoff Spectroscopy Using a Conditioned Target Identifies Hazardous Materials at a Distance

UT-B ID 200902335



Technology Summary

A safer method for the standoff (long distance) detection and identification of molecules on a surface has been invented by researchers at ORNL and the University of Tennessee. This invention avoids the necessity of close and potentially hazardous contact. It combines tunable infrared (IR) and ultraviolet (UV) spectroscopy techniques to target identifying properties of surface residues.

In this invention, an initial IR spectrum of a surface thought to contain a residue is taken with a tunable IR source. Next, the surface is pulsed with a particular wavelength of UV light, which causes the residue of interest (if present) to decompose. Finally, another IR spectrum is taken, and the two IR spectra are compared. The difference between the IR spectra before and after UV radiation will confirm or refute the presence of the residue of interest. If present, the spectra will exhibit absorption peaks distinctive of the decomposed molecules of interest.

Advantages

- Allows standoff detection
- Requires no high-powered lasers
- Generates a unique chemical signature

Potential Applications

- Detects explosives, leaks, chemicals, biologicals, and minerals
- Useful to the Department of Homeland Security, military, law enforcement, forensic science, planetary science, industry, and households

Patent

Charles W. Van Neste, Marissa E. Morales-Rodriguez, Lawrence R. Senesac, and Thomas G. Thundat, *Standoff Spectroscopy Using a Conditioned Target*, U.S. Patent Application 12/828,064, filed June 30, 2010.

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