

"White" Powder Identification



Introduction:

As a result of 9-11 and the consequent formation of the Homeland Security Agency, the need for equipment to identify unknown substances has evolved. Because all organic molecules and most inorganic molecules have unique mid-infrared spectra FT-IR, spectrometers have become widely used for this purpose and extensive libraries of IR spectra have been established. FTIR instruments work very well for powder identification however, they are relatively expensive and not readily portable. The InfraSpec VFA-IR Spectrometer is an

excellent supplement for the FTIR because it is small, portable, relatively inexpensive and useable wherever materials occur that require identification.

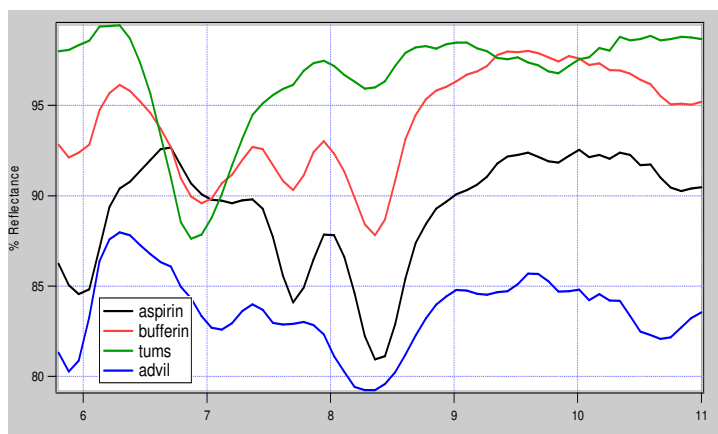
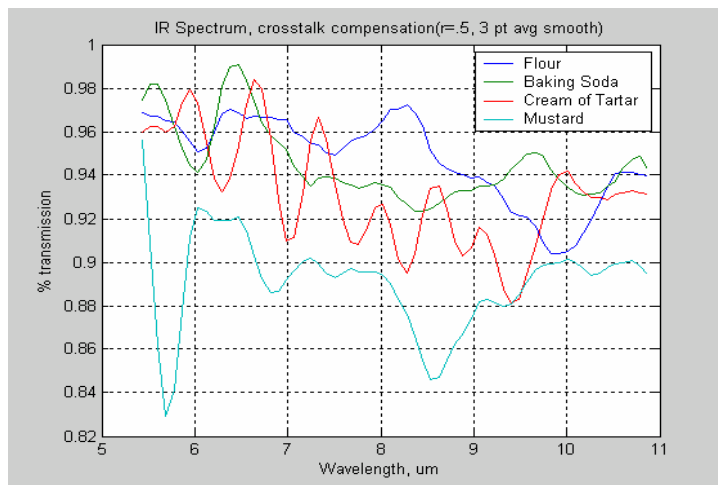
Operating Principal:

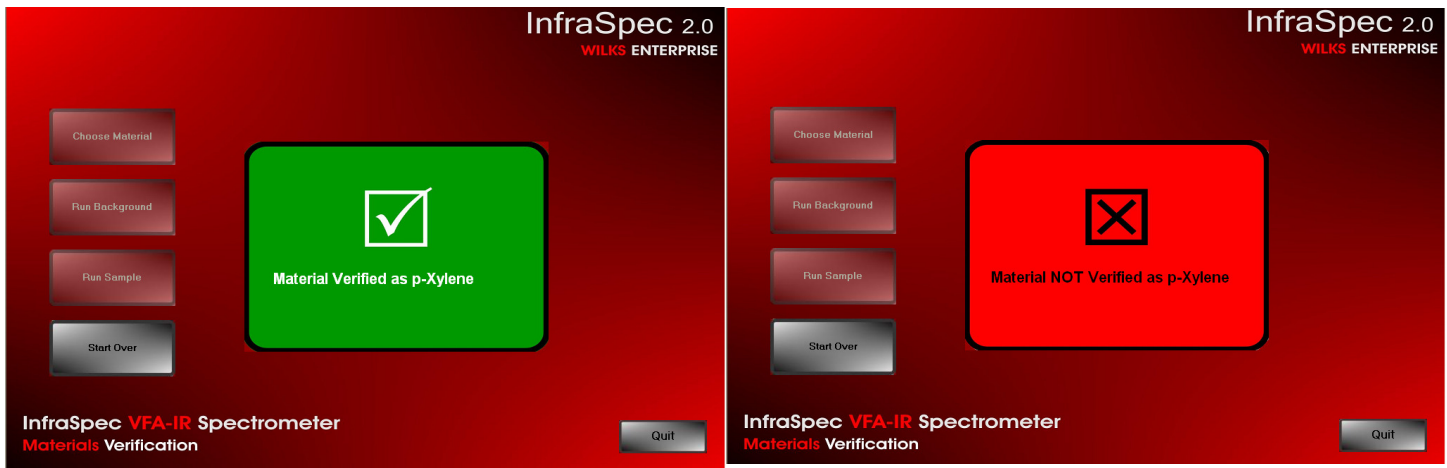
The InfraSpec VFA-IR Spectrometer is a new concept in mid infrared instrumentation. It utilizes a patented design consisting of an electronically modulated source on one end and a linear variable filter (LVF) and 128 pixel detector array on the other. The result is a compact spectrometer with no moving parts, no optical path exposed to air. A LVF typically covers an octave in wavelength (ie: 2.5-5.0 μm ($2000\text{-}400\text{ cm}^{-1}$) or 5.4-10.8 μm ($1850\text{-}925\text{ cm}^{-1}$)).

Analysis:

A small amount of powder sample is placed on the ATR surface and good contact is insured with a pressure clamp provided with the sample platform. When the amount of powder is limited, the powder can be first placed on the sticky side of adhesive tape and then placed on the ATR (attenuated total reflection) crystal for analysis. The sample tape can then be marked and stored for future reference. Materials will be identified by the spectral library stored in the InfraSpec software.

Common Household Materials





With a simple interface for non technical operators, a material is placed on the sample plate and with predetermined parameters the material either is accepted or rejected as shown in these screen displays. The spectrum is stored for technicians to review if necessary. A library of materials can be stored and called up for verification as shown in the sample above.

Specifications:

Dimensions	5" x 3" x 1.5", 12.7 x 7.6 x 3.8 cm³
Weight	3.5 lbs., 1.5 kg
P.C. Interface	RS 232, USB
Power Requirements	12V DC, 2.0 amps
Power Supply	Universal AC/DC converter type (supplied as standard)
Suggested Temperature Operating Range	15°C - 60°C
Humidity	0 – 98% relative humidity (non-condensing)
Detector Array	128 Pixel linear pyroelectric array
Array Responsivity	5.4-10⁵ V/W
Standard Spectral Ranges	2.5-5 μm (2000-400 cm⁻¹), 5.4-10.8 μm (1850-925 cm⁻¹)
For InfraSpec VFA-IR Spectrometer ATR Sample Plate	
ATR Crystal Material	Cubic Zirconia, Zinc Selenide, or Zinc Sulfide
ATR Surface Size	50 x 16 mm
# of Reflections	10
Resolution	25 cm⁻¹

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