PRODUCT NOTE

Key Features

- Straightforward analysis of most sample types with a minimum of sample preparation
- Interactive pressure control ensures optimum contact between sample and diamond for high quality, reproducible spectra
- ATR automatically recognized and checked by instrument
- Easy to clean diamond top-plate

Universal ATR Polarization Accessory for Frontier FT-IR Spectrometers

Attenuated total reflectance (ATR) techniques have been well established in FT-IR spectroscopy for many years. They offer a convenient alternative to thin-film, KBr pellet or diffuse reflectance measurements.

Horizontal ATR accessories using crystal materials such as zinc selenide, thallium bromide/iodide and germanium are used extensively for analysis of liquids, oils, waxes and soft polymeric materials. However, since these crystal materials are relatively soft, they can be easily damaged and are therefore not ideal for the analysis of powders or hard solids.

The introduction of diamond ATR units has meant that the vast majority of sample types, whether liquids, powders, or hard minerals, can be analyzed routinely using a single accessory.

PerkinElmer®
For the Better

The PerkinElmer® Universal ATR Accessory offers straight-forward analysis of most sample types with a minimum of sample preparation. It features an interactive pressure control so that exactly the right contact is made between the sample and the diamond, resulting in high quality, reproducible spectra.

1. The PerkinElmer Frontier, Spectrum™ 100 or Spectrum 400 FT-IR and FT-NIR systems will automatically recognize the accessory, and with user-defined analysis parameters, the accessory
   performance is checked automatically prior to analysis.

2. The diamond top-plate is easy to clean using a dry or solvent-containing tissue.

The Universal ATR Polarization Accessory combines the above sampling benefits with the ability to acquire polarized IR spectra.

A variable-angle polarizer is slotted into the accessory and the user simply sets the required angle. For non-polarized measurements the polarizer is removed.

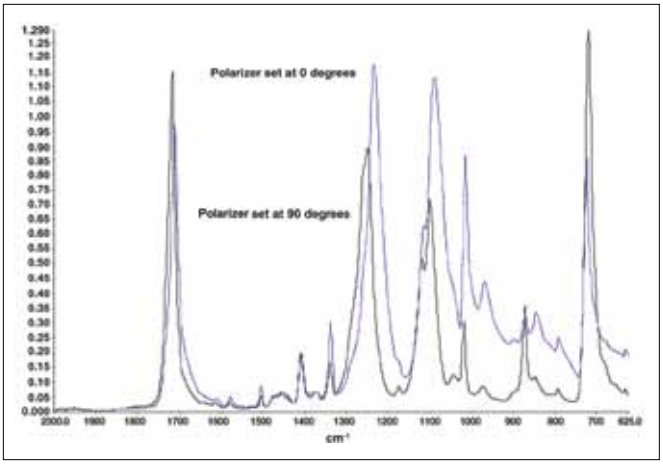

Figure 1. Differences in spectra shown when parallel and perpendicularly polarized spectra from the wall of a PET bottle are measured.

The benefit of polarization measurements is that they give additional information on the molecular structure of a sample, particularly the crystal or molecular orientation. For example, the dichroic ratio is often measured for specific absorbance bands in the spectrum and is defined as the ratio of the absorbance measured using parallel-polarized radiation, divided by the absorbance measured using perpendicular-polarized radiation.

Application areas where these polarization measurements are particularly useful are crystal structure analysis, polymer and fiber orientation studies and structural studies of biomolecules such as proteins.

An example of the need for polarized measurements is in the manufacture of PET (polyethylene terephthalate) bottles. These bottles are blow molded from a pre-form and the strength of the bottle is dependent on the long chain molecules of the PET polymer being preferentially oriented around the circumference rather than along the axis. The polarized IR spectra from the wall of a bottle are shown in Figure 1, demonstrating the difference in the spectra when parallel and perpendicular polarized spectra are measured.

Ordering information

Universal ATR Polarization Accessories:

Single reflection accessory	L1250064
Three reflection accessory	L1250065
Nine reflection accessory	L1250066

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