

Micro Sample Analysis using ATR PRO ONE VIEW

Introduction

The use of ATR is an effective method for fast and efficient IR measurement. When using ATR, it is necessary to correctly set and press the sample at the center of the prism to obtain good quality data, especially when measuring a micro sample which may be smaller than the prism.

JASCO's latest accessory, the ATR PRO ONE VIEW has an observation function to locate the ideal measurement position, while displaying the sample area on the front monitor or PC.

In this application note we tested several cosmetic eyelashes. There are many different types of false eyelashes for cosmetic purpose, which are claimed to be made from human hair, animal hair, or natural fibers according to the material labeling. However, false eyelashes are often labeled as from animal sources when in fact they are made from synthetic fabric. The analytical evaluation between human eyelashes and false eyelashes claimed as human hair is made here using the ATR PRO ONE VIEW.

Keywords

Micro sample, Material analysis, ATR

Measurement Method

Set the human eyelash and the false eyelash claimed as human hair commercially on the center of the prism using the monitor. Measurement conditions are shown below.

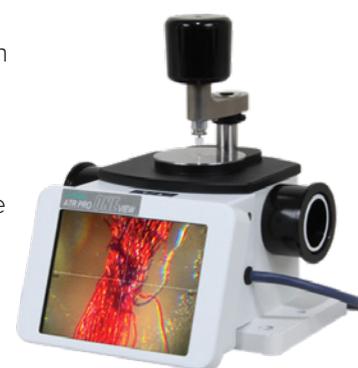


Figure 1. ATR PRO ONE VIEW

Measurement	
Instruments	FT/IR-4600
Resolution	4 cm ⁻¹
Method	ATR
Detector	DLATGS
Accumulation	50 times
Accessory	ATR PRO ONE VIEW
Prism	PKS-D1V

Result

Figure 2 shows the sample images and the IR spectra of a human eyelash and a false eyelash. As shown in the images, the samples were set at the center of the prism. Peaks derived from Amide I, II are detected around 1640 cm^{-1} and 1550 cm^{-1} in the human eyelash IR spectrum, which means that main component of human eyelash is protein. The spectrum of the false eyelash IR is different from human's, and indicates the existence of a synthetic fiber. The main component was identified as polybutylene terephthalate by database searching.

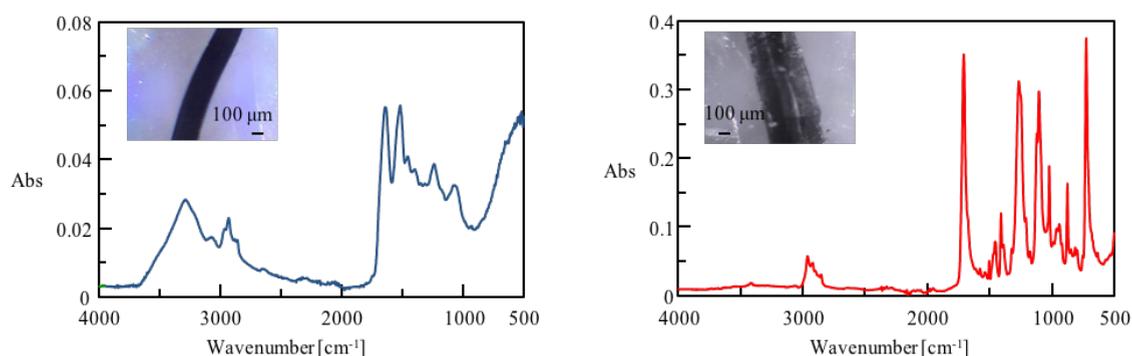


Figure 2. IR spectra of human eyelash (left) and false eyelash (right)

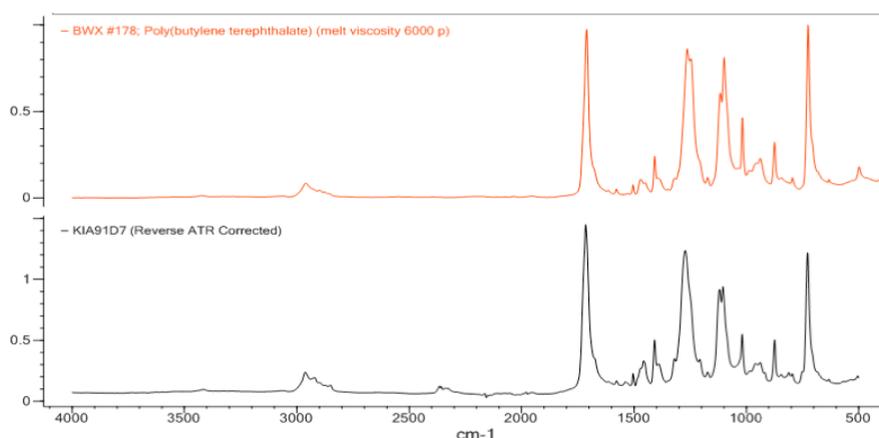


Figure 3. IR spectra of polybutylene terephthalate standard (top) and false eyelash (bottom)

Conclusion

The ATR PRO ONE VIEW is a fast and effective tool for measuring micro samples, in this case the main component of the false eyelash was identified as polyester.

In general, the application of non-destructive analytical techniques for micro samples is very important for foreign material analysis, criminal investigation and false labeling.

This note shows that ATR PRO ONE VIEW is highly effective for non-destructive micro sample analysis in a variety of application fields.

Because the ATR PRO ONE VIEW provides not only analytical information but also spatial information like sample view and size.