APPENDIX 4

FTIR TEST REPORT

Analysis Report of Fibrous Material
July 17, 2000
Merritt Birky

An S shaped duct from a B-747-131 airplane (serial number 19675 and hull number 43 built in 1970) was examined. Seat covering fabric and floor carpet samples from the passenger compartment of this aircraft were also examined. Sample preparation and visual (microscopic) examination of the samples were conducted at NTSB headquarters. FTIR examination of the samples was conducted at Shimadzu Industries, of Columbia, Maryland, by Dr James Girard of American University.

Residue samples were collected from the outer surface of the S duct by the National Transportation Safety Board staff and examined in the Safety Board laboratory. Examination of this residue with a stereomicroscope showed the presence of fibers and other debris. Red, blue, and blended, or grayish fibers, were removed from these samples, and visually examined under magnification. Seat covering and carpet samples from the aircraft were also visually examined under magnification. Under visual magnification, the red, blue, and grayish fibers collected from the outer surface of the S duct looked similar in color and morphology to the similarly colored fibers from the seat and carpet fabric.

The fibers removed from the duct residue, seat fabric and carpet fibers were then sent to Dr Girard for analysis. FTIR analysis was done on small pieces of the seat fabric and carpeting. Additionally, each individual fiber from the S duct was analyzed via FTIR microscopy. A comparison of the spectra from these samples was then made. The comparison shows that the red and blue fibers taken from the duct are similar in spectral character to the red and blue fibers taken from the set cover fabric. The grayish colored fiber taken from the duct is similar in spectral character to the gray carpet fiber. The comparison spectra for the different colored fibers are shown in figures 1 through 6.

The conclusion from these analyses is that the red, blue, and grayish colored fibers from the residue found on the outside surface of the S duct, are the consistent with those of the seat fabric and carpeting found in the aircraft. This conclusion is based upon:

1. The morphology between the carpet and seat fabric fibers and the fibers found on the S duct are consistent.

2. The FTIR spectra between the carpet and seat fabric fibers and the fibers found on the S duct are consistent.

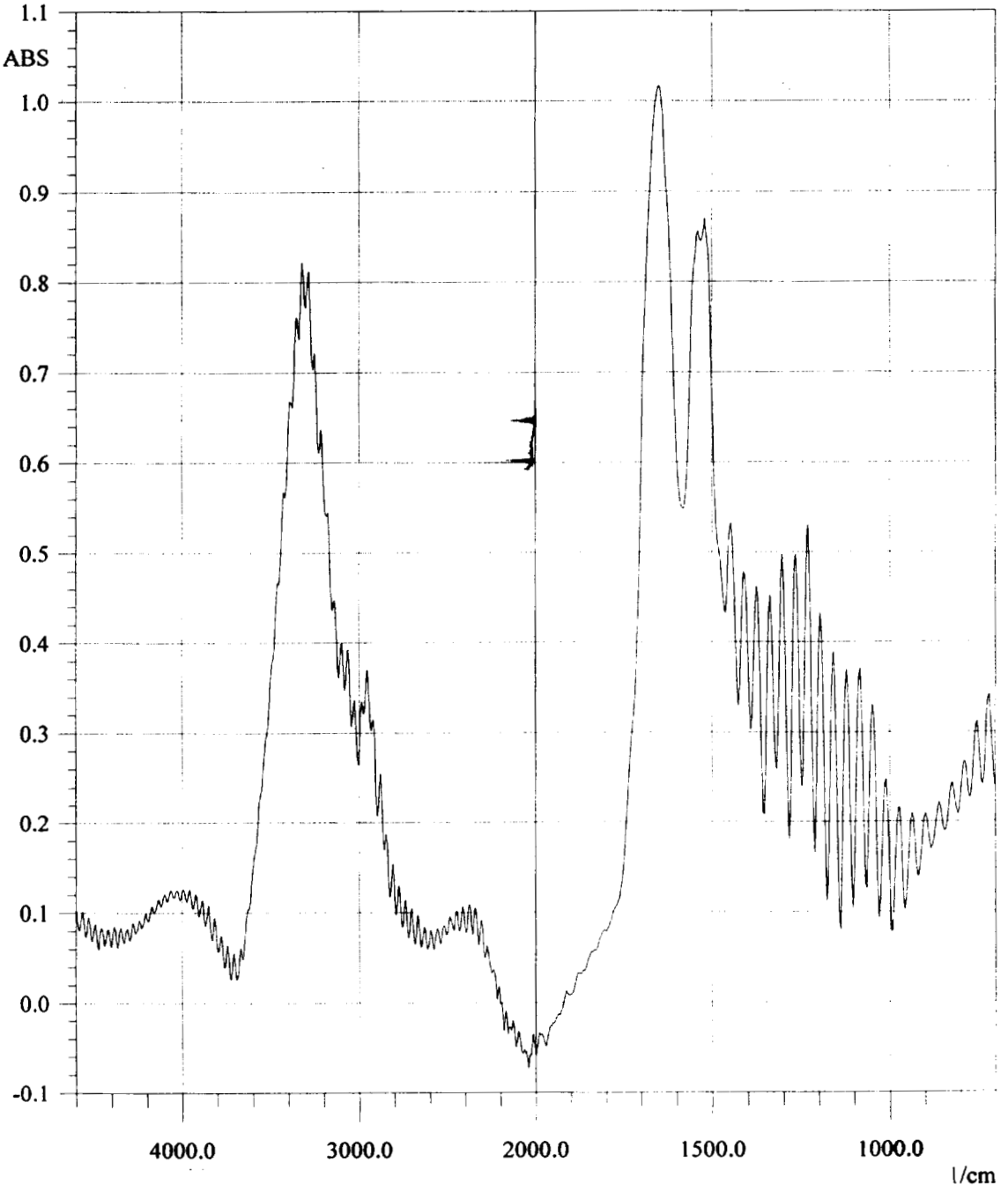

Figure 1- FTIR Spectrum of Known Red Seat Cover Fiber

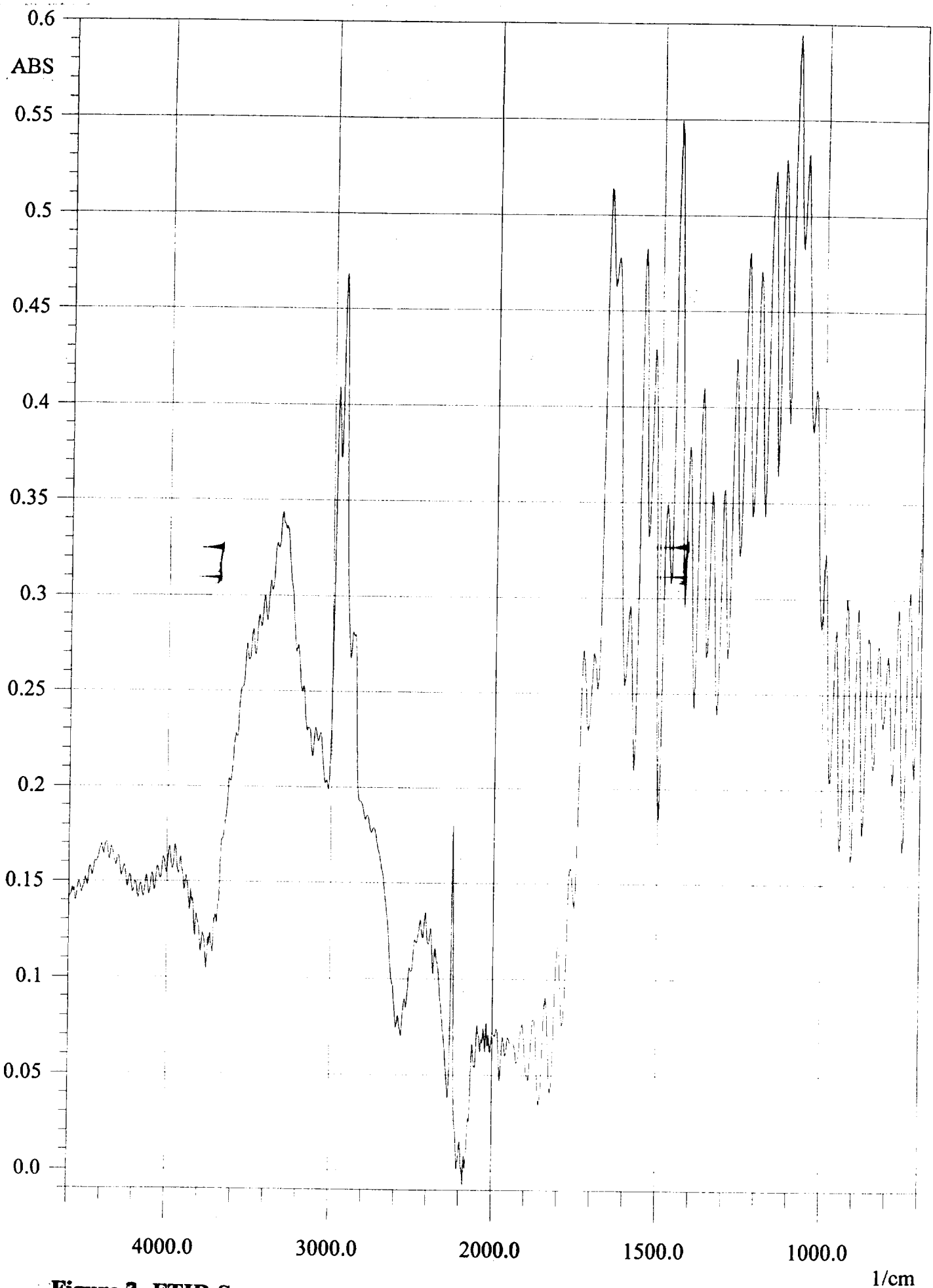

Figure 2- FTIR Spectrum of Unknown Red Fiber

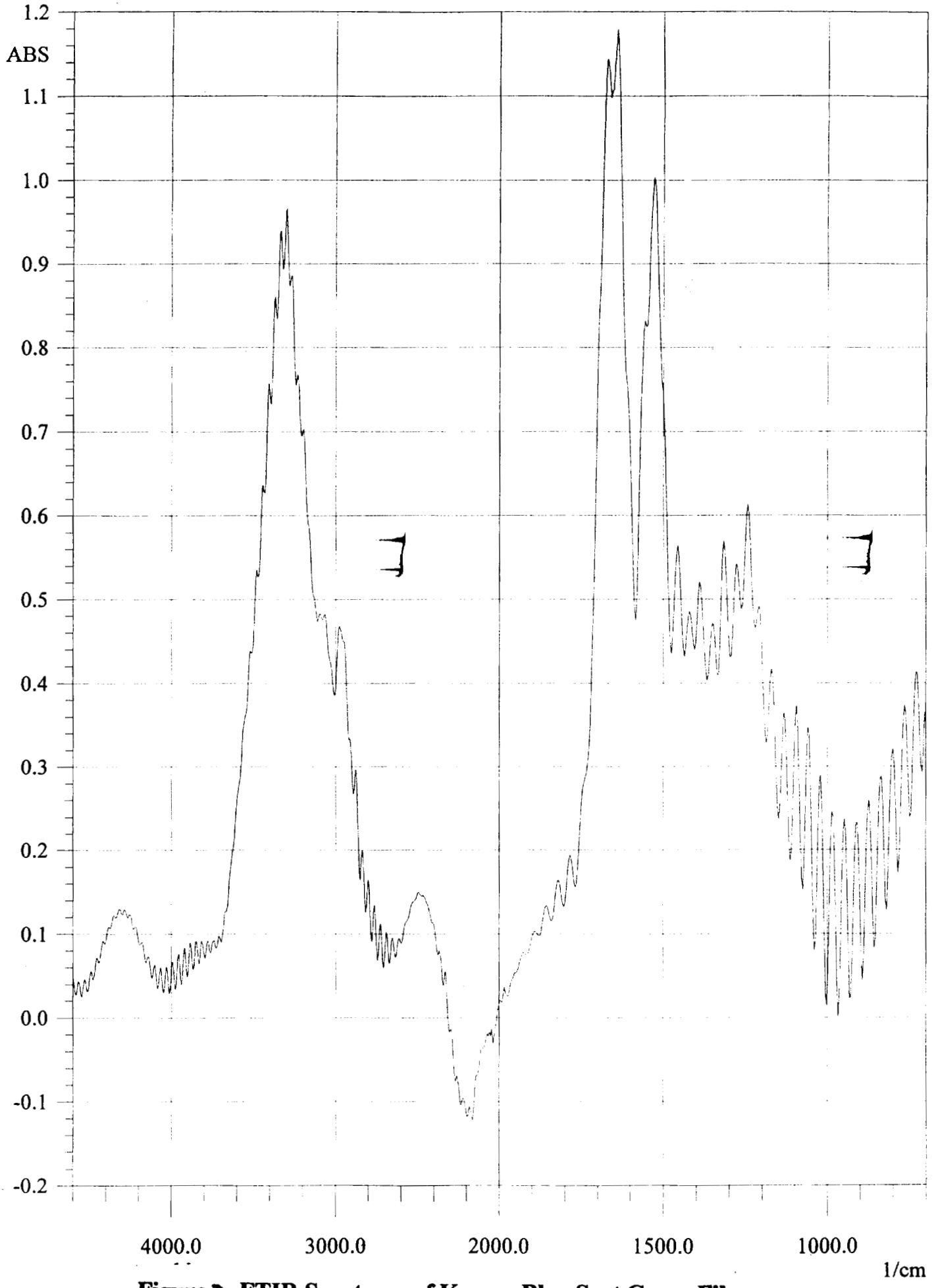

Figure 3- FTIR Spectrum of Known Blue Seat Cover Fiber

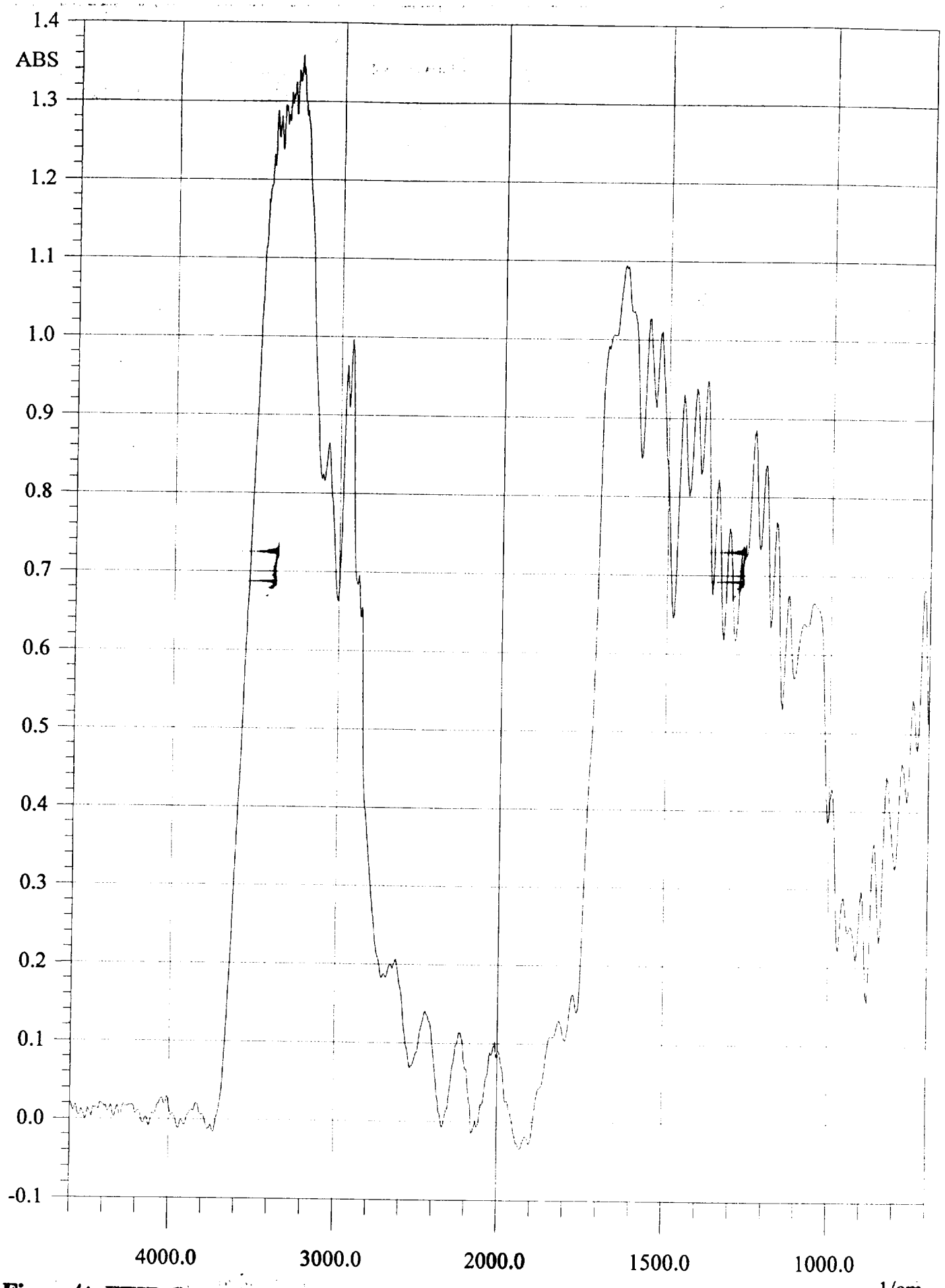

Figure 4- FTIR Spectrum of Unknown Blue Fiber

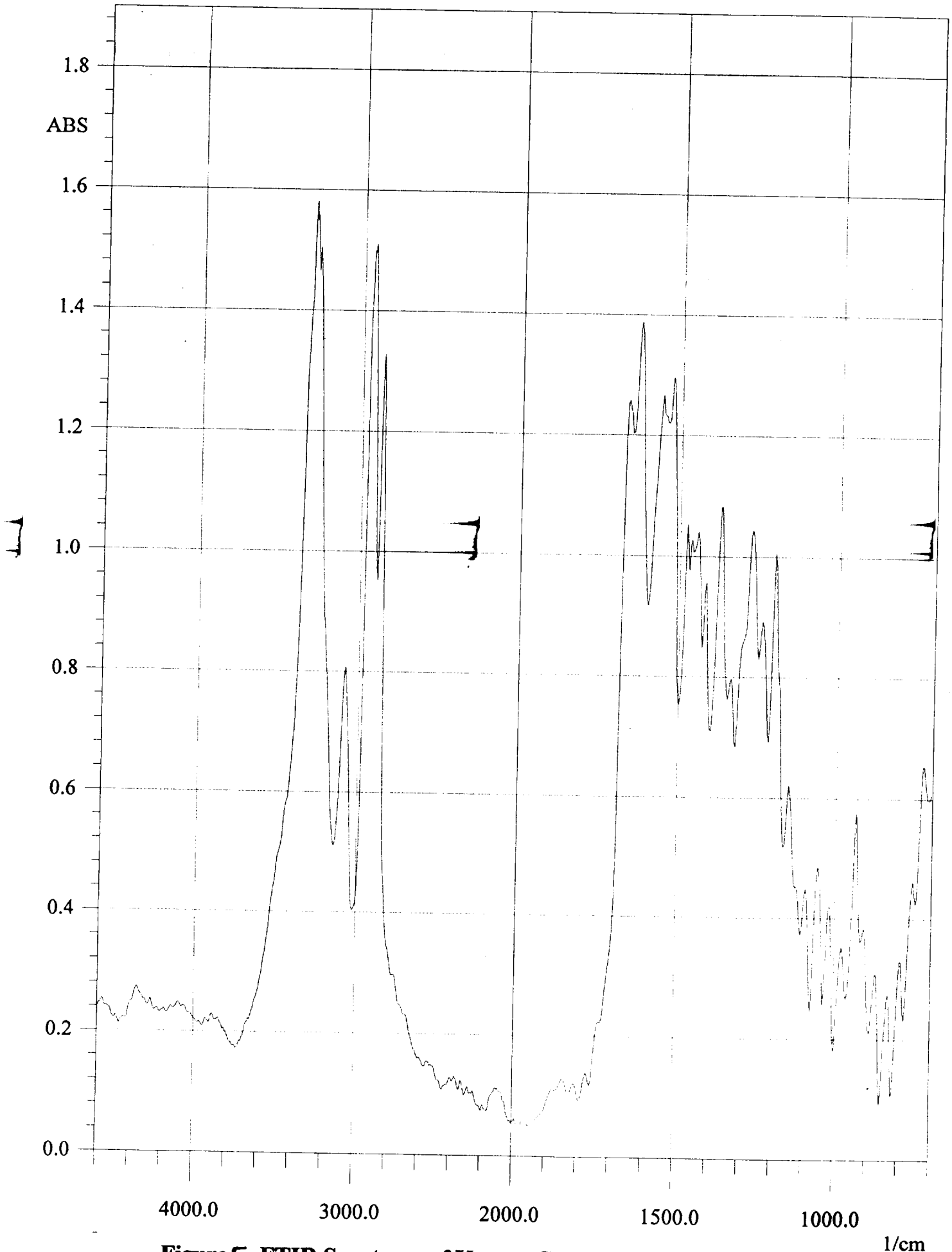

Figure 5- FTIR Spectrum of Known Grey Carpet Fiber

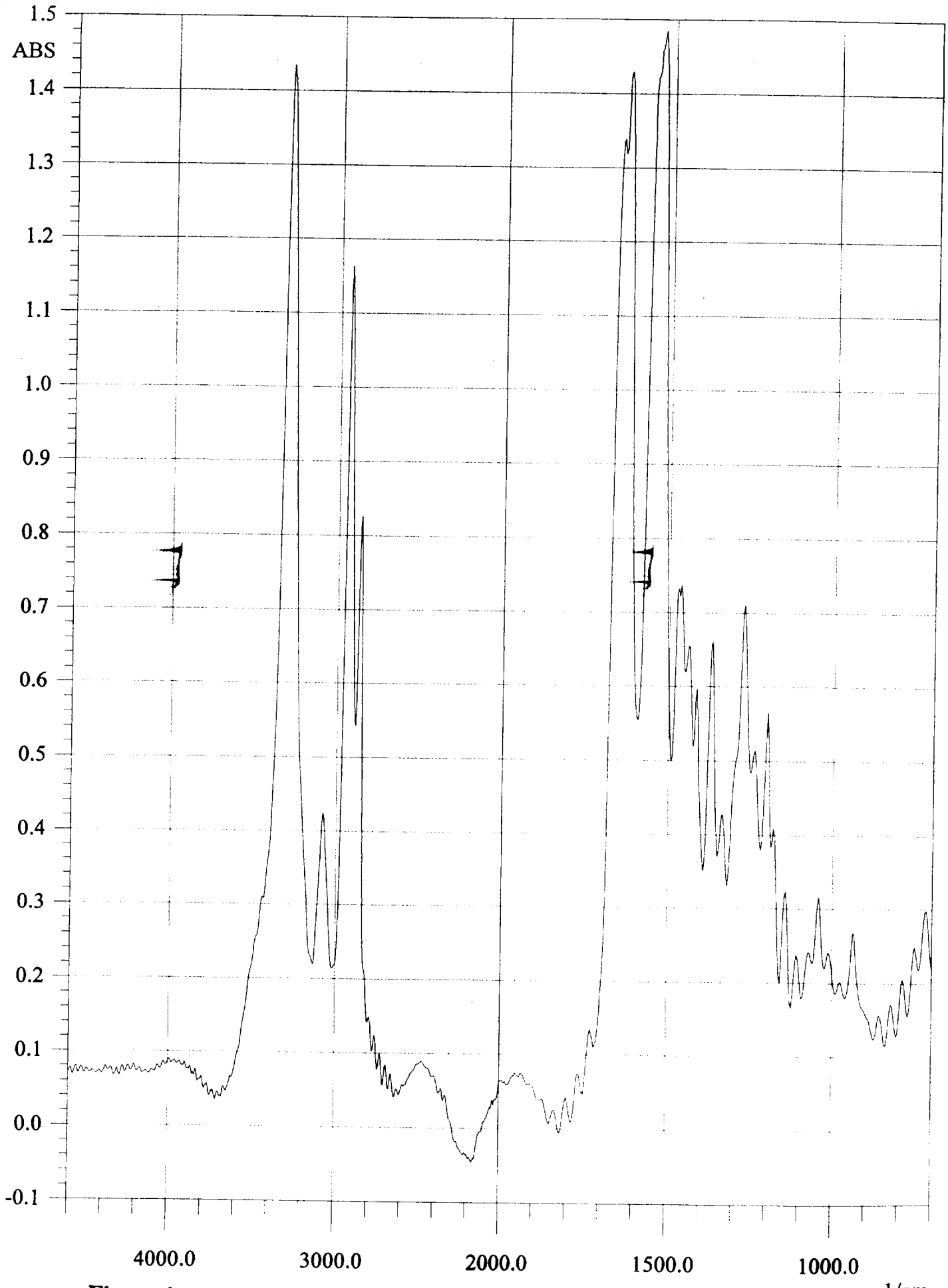

Figure 6- FTIR Spectrum of Unknown Grey Carpet Fiber