Smart Collector™

For Research Grade Diffuse Analysis

The Thermo Scientific Smart Collector, designed for the infrared analysis of solid samples, especially powdered materials, is one of the most advanced and versatile accessories for Diffuse Reflectance Infrared Fourier Transform Spectroscopy (DRIFTS). Diffuse reflection greatly simplifies the preparation of samples compared to traditional techniques such as KBr pellets and mulls. For the research laboratory environment, the Smart Collector utilizes a unique optical design that increases the percentage of diffuse reflection required to obtain nanogram levels of sensitivity. Combined with the environmental chamber option, the Smart Collector can perform a wide variety of diffuse reflectance experiments quickly and easily at elevated temperatures, high pressure, and vacuum conditions with minimal sample preparation.

Example Applications

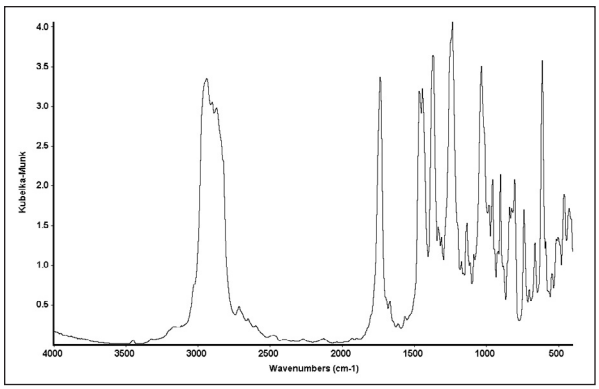
- Solids
- Powders
- Organic and inorganic samples

Unique Features

An infrared spectrum collected from other diffuse reflection accessories can be distorted by the presence of unwanted specular radiation from the front surface of the sample. This spectral distortion is typically observed with undiluted inorganic samples, and higher concentrations of strong infrared absorbers. This distortion can be observed as band inversion (Restrahlen bands) or derivative shaped bands. To eliminate this distortion, the Smart Collector incorporates unique collection optics that inherently maximize diffuse reflected radiation while minimizing the specular reflected component. This optical design also eliminates the need for any manual or automatic sample height adjustments because it is always at the optimum position and optical focus.

The Smart Collector is the only research diffuse reflectance accessory that has the optional, easy to use and install environmental chambers. These chambers can be quickly installed with minimal effort and with no realignment of the accessory. The ability to perform in-situ measurements of solid materials can provide invaluable information. Studies such as heterogeneous catalytic mechanisms, thermal degradation studies, and zeolite analyses can be monitored with elevated temperatures/pressure or under vacuum. Samples sensitive to oxygen or the atmosphere can be handled by preparing the chamber in a standard glove box.

The Smart Collector has been designed for high energy throughput and ease of use. The Smart Collector comes complete with two sample holders. One holder has two integral sample cups within it. Typically, one of the positions is loaded with the sample, and the other is loaded with a reference material such as potassium bromide (KBr). The integral sample cups eliminate the need to worry about small parts that can be easily lost and makes it easy to load samples without the risk of dropping small sample cups. The second holder has an integral mirror mounted in it that can be used for performance testing, and a slot for a Si-Carb platen. The Si-Carb Sampling Kit is used to obtain spectra of hard, intractable samples, such as coatings, paints, and hard polymers. The Si-Carb kit includes the adhesive-backed silicon carbide paper that is used to abrade the surface to be analyzed, and a handle and platen to hold the paper. This technique transfers a small amount of sample to the disk. An infrared spectrum is obtained of the material clinging to the surface of the silicon carbide disk. If KBr is needed to dilute a sample for analysis, the convenient KBr Powder Packets can be used. Each of the KBr Powder Packets contains a convenient, pre-measured quantity of dry KBr for dispersing a sample.



Cholesteryl acetate 1% in KBr collected using the Smart Collector

Specifications

Sample Cup Volume: Approximately 0.25 gram

Environmental Chambers: Temperature, pressure and vacuum

KBr Powder Packets: Qty. of 25, (0.5 gram each)

Silicon Carbide Disks: 100 each Si-Carb adhesive backed disks, with 320 grit and 400 grit

Ordering Information

Accessory	Part Number
Smart Collector	0031-9XX
Smart Collector HT/HP/Vacuum Chamber	0031-901
Smart Collector Dual HT/HP/Vacuum Chamber	0031-902
USB Controller for HT/HP/Vacuum Chamber	222-235400
USB Controller for Dual Chamber	222-238000

XX = 99 for Nicolet™ iS™ 10 and Nicolet x700 *XX = 99 for Nicolet Nexus™*
XX = 97 for Nicolet 380 and Avatar™

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