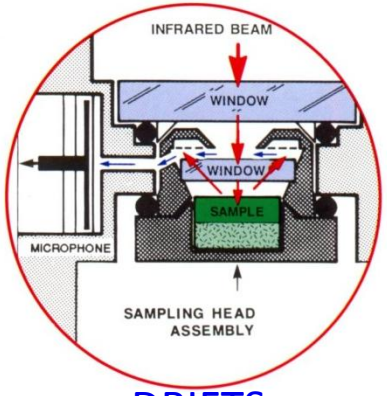
MTEC Sampling Head Options

MTEC offers special sampling head options so that the PAC300 Photoacoustic Detector can be used for a variety of measurements by just inserting a different sample holder in the detector with the appropriate sampling head. This allows DRIFTS and transmission spectra to be measured which can reveal information that's complementary to PAS spectra. Sampling heads are also offered for PAS measurements on microsamples and gases.

Sampling Heads for DRIFTS, PAS, and Transmission

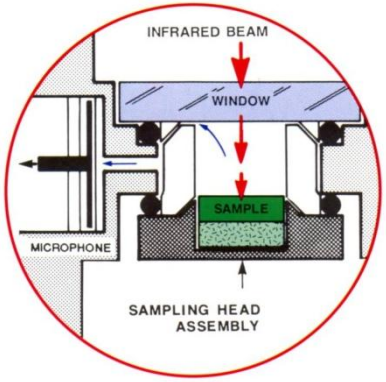
Multi-Sampling Option SH003

Three sampling heads interchange in a second to sequentially measure DRIFTS, PAS, and transmission spectra of samples.



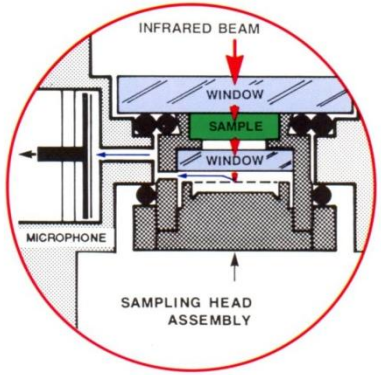
DRIFTS

The IR beam passes through a second window that isolates the sample from the microphone. Diffusely reflected light strikes a black membrane (dotted line) generating a DRIFTS-PA signal that's sensed by the microphone.



PAS

PAS spectra are measured by lifting the DRIFTS cap off the sampling head and replacing it with the PAS cap. The sample remains undisturbed.



Transmission

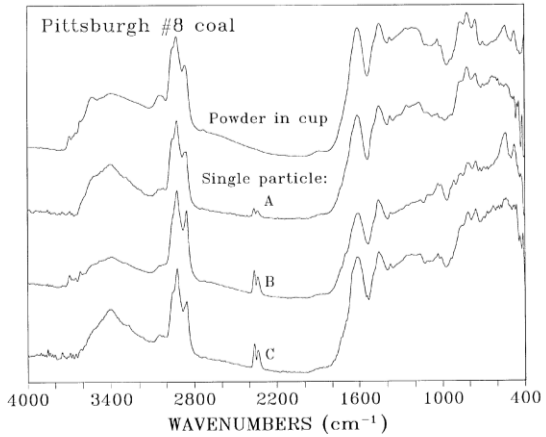
Windows above and below the sample seal it off from the microphone which senses the transmission-PA signal generated by light transmitted by the sample that strikes a black membrane (dotted line).

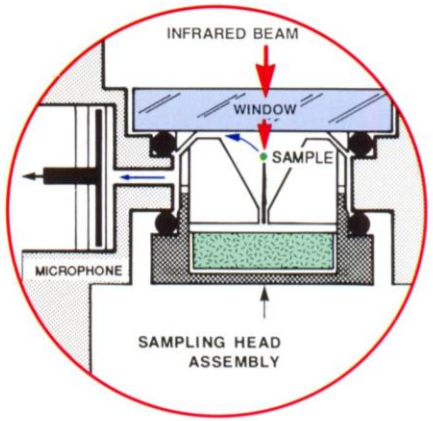
Sampling Heads for Single Particles and Fibers

Micro-Sampling Option SH004

Two interchangeable sampling heads allow spectra to be measured of single fibers and particles. Fibers are mounted in a ring clamp. Particles are picked up electrostatically with a fine pointed tungsten needle which is then placed in the sampling head. A micro manipulator is included to facilitate particle pick up.

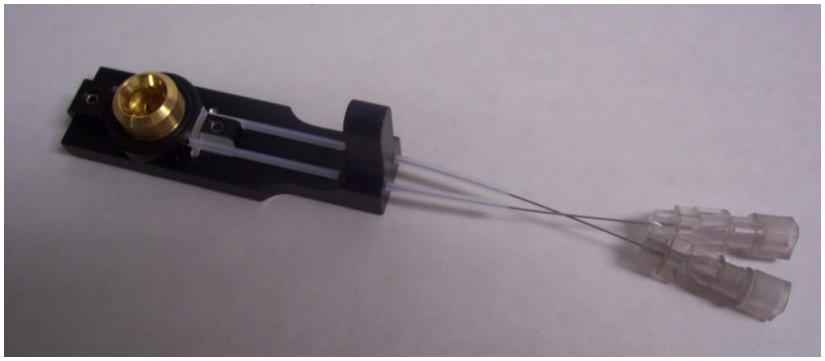
The size of the FTIR's beam is much larger than the sample which intercepts a tiny amount of the light. The resulting small amount of heat produced is compensated for by the enhanced heat transfer to the gas due to the sample's low thermal mass and multiple reflections of thermal waves within the sample. This phenomenon allows fibers with diameters as small as 10 microns and particles above 50 microns to be measured with a 6mm diameter IR beam focus size. The spectra below show that the mineral content of coal particles vary from one particle to the next.





Gold Plated Sampling Head for Gas Analyses

Analyzes less than 1cc volume gas samples. Small gas volume allows for fast purging between samples using the PAC300's helium purge system. Multiple reflection geometry increases sensitivity. Gold plated high conductivity copper construction reduces background signals. Includes internal desiccant to remove moisture.



Operates with Luer fittings in sealed or continuous flow modes. Incorporates stainless steel gas lines and teflon seals.