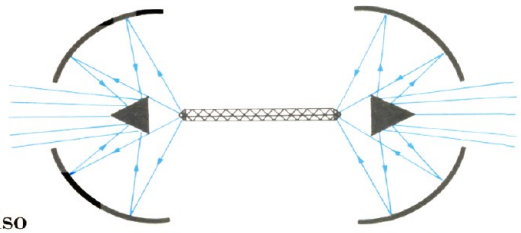
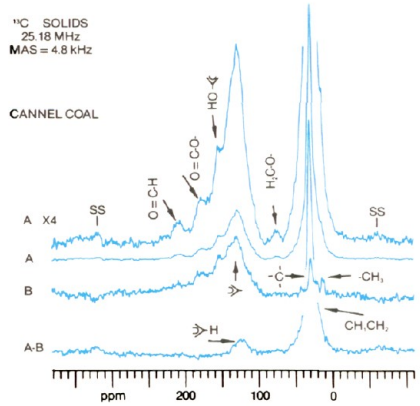
IBM Instruments
LAB JOURNAL
A periodic report on innovative laboratory techniques.

FTIR technique creates breakthrough in difficult liquid analysis.



Quantitative analysis of antibiotics in solutions and broths can now be accomplished easily with IBM Instruments internal reflectance FTIR. This automated technique requires minimal or no sample preparation, which makes it faster and more economical than chromatographic methods. The technique also overcomes limitations of traditional flow-through IR methodologies. More important, though, internal reflectance FTIR has the ability to monitor the on-going fermentation process, as well as subsequent chemical reactions.



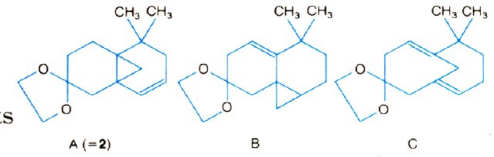
New NMR methods used to probe molecular structure/dynamics in solids.

Resolution-enhancing techniques now produce NMR spectra for solids that rival the quality of spectra for solutions. Utilizing a high resolution NMR spectrometer from IBM Instruments, the technique is being applied to chemical identification, chemical exchange, solid-to-solution comparisons and characterization of molecular dynamics. The method has provided new information on the dynamics of phospholipids in model membrane systems; the aliphatic/aromatic content of coals (with functional group identifications); determination of SiO_4 tetrahedral units in clay zeolites and aluminosilicates; and molecular motion in solid polymers.

FT/IRRAS advances studies of surface phenomena.

Researchers studying surface phenomena can now benefit from the non-destructive nature of Fourier transform infrared reflection absorbance spectroscopy. IBM Instruments FT/IRRAS technique is particularly useful in characterizing details of angstrom-thin surface layers. For example, researchers have been able to investigate surface interactions such as energy transfer, electron transfer and chemical diffusion using mono-layer assemblies of long-chain fatty acids as models. And data are in agreement with reported ESCA results.

LC and NMR optimize yield in natural product synthesis.



University researchers recently utilized an IBM Instruments integrated approach to chemical synthesis to maximize the yield of vinylcyclopropane 2. They used LC to isolate the reaction components, then NMR to determine structural assignments and confirm reaction product purity. Once the monitoring techniques were established, the researchers were able to explore experimental procedures to increase the yield of the desired compound.