Practical methods to enhance efficiency and versatility of NMR

Fourier Transform NMR Spectroscopy

an audiocassette course produced by The American Chemical Society

- **Shows how to run and analyze previously unobtainable spectra**
- **Features a wide range of applications in chemical and biological systems**
- **Explains how Pulse FT NMR speeds process of running spectra**

Probably the single most important and far-reaching advance in NMR techniques in the last fifteen years has been the development and widespread adoption of Fourier Transform methods.

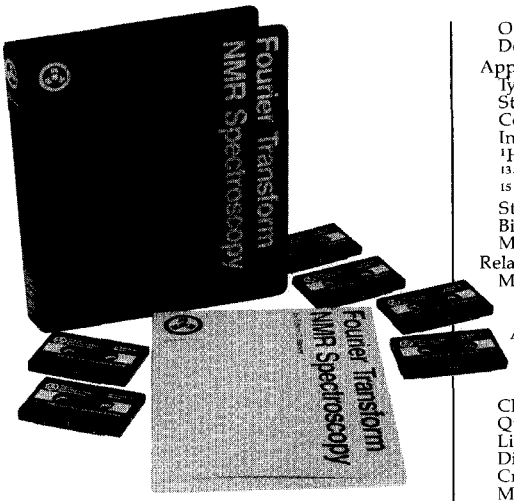
This course examines those methods, the rationale for their use, and some of the ways they are being used to solve chemical and biochemical problems. The concentration is on techniques with the approach to theory largely descriptive rather than highly mathematical. The course emphasizes, in a practical manner, optimum ways to use the Fourier Transform methods it covers.

INSTRUCTOR

Dr. Edwin D. Becker, Associate Director of Research Services, National Institutes of Health, is author or coauthor of approximately 75 research papers and 2 books. He has received the Coblentz Memorial Prize in Chemical Spectroscopy.

UNIT

Six audiotape cassettes (4.3 hours playing time) and a 90-page manual, $245.00, U.S. price. Additional manuals for group use: $13.50 each, U.S. price. *(Catalog no. 71CE)*



COURSE OUTLINE

The Physical Basis of NMR
- Introduction: Scope of the Course
- The Rotating Frame
- Nuclear Relaxation
- Means of Exciting NMR Spectra
- Characteristics of the Free Induction Decay
- Fourier Transformation: Time and Frequency Domains

Pulse-Fourier Transform NMR
- The Pulse Spectrometer
- Pulse Power and the 90° Pulse Width
- Phase Sensitive Detection
- Determination of the Spectral Width
- Acquisition Time: Resolution and Signal-Noise
- Exponential Filtering
- Zero Filling
- Phase Corrections
- Other Software Features
- Decoupling

Applications of Pulse-FT NMR
- Typical Time-saving in Data Acquisition
- Study of Rapid Reactions
- Coherent Time-averaging
- Instrumental Factors Affecting Signal/Noise
- ^{1}H NMR: Examples and Current Status
- ^{13}C NMR
- ^{15}N NMR
- Study of Other Nuclei
- Biological Samples
- Measurement of Relaxation Times

Relaxation—Mechanisms and Applications
- Molecular Motions and Fluctuating Fields
- Nuclear Relaxation Mechanisms
- Some Applications of Relaxation Data
- Applications to Exchange and Diffusion Measurements
- High Resolution NMR in Solids
- Magnetic Dipolar Interactions
- Chemical Shift Anisotropy
- Quadrupole Interactions
- Line-narrowing Pulse Cycles
- Dipolar Decoupling
- Cross Polarization
- Magic Angle Spinning
- Multiple Quantum Coherence

More General Fourier Transform Methods
- Rapid Scan Correlation Technique
- Stochastic Excitation
- Synthesized Excitation
- Methods of Overcoming Incoming Interference by Solvents
- Two-dimensional Fourier Transform Methods
- NMR Imaging Methods
- Other Branches of Spectroscopy

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