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Volume 157, Chemical Analysis Series

## Raman Spectroscopy for Chemical Analysis

Richard L. McCreery

£ 71.50 \$ 99.95 

[Wiley-Interscience](#), pp 448

Hardback ISBN 0-471-25287-5

**Although the Raman effect was first described in 1928, the instrumentation required to observe the weak process was too cumbersome and expensive for routine analysis. As a result, Raman spectroscopy has often been sidelined as an analytical technique in favor of traditional infrared absorption techniques.**

With the advent of a Fourier transform (FT) instrument in 1986 followed by other technological advances [e.g. charge-coupled device (CCD) detectors, compact spectrographs, effective laser rejection filters, near-infrared lasers, powerful desktop computers], Raman spectroscopy has experienced a renaissance, enjoying increased application in routine chemical analysis.

In the 13-chapter volume *Raman Spectroscopy for Chemical Analysis*, Richard L. McCreery surveys recent developments in instrument design and discusses the state-of-the-art with particular emphasis on calibration, performance, and sampling modes. The level of discussion is appropriate for newcomers to the field, including graduate students, and those in the market for a commercial Raman spectrometer will find the volume particularly useful.

The effort and meticulous care put forth in producing this volume are praiseworthy, a hallmark of the Wiley-Interscience *Chemical Analysis* series. The author makes clear that the volume is not intended to delve into the physics of the Raman process nor serve as a substitute for the many fine texts and monographs on this subject. Rather, the book is designed as a practical guide to the instrumental aspects of the modern Raman spectrometer, its layout and performance features.



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Chapter 1 provides a historical perspective of Raman as it relates to its cousins FTIR and NIR. Chapters 2 and 3 cover the Raman cross section and collection and detection functions. Chapter 4 provides a reasonable amount of detail on parameters influencing signal-to-noise ratio (SNR), particularly those arising from the high throughput and multiplexing capability of FT instruments. Chapters 5 to 9 discuss the anatomy of the Raman spectrometer (both dispersive and nondispersive) and include laser source considerations, sampling mode geometries, detector selection, and general performance criteria. Chapter 10 deals with frequency, Raman shift, and instrument response function calibration as well as validation procedures essential for collecting accurate and reproducible spectra. The most original portion of the volume is the final three chapters which address the specialty areas of Raman microscopy/imaging, fiber-optic Raman sampling, and Raman for surface analysis.

Although the book is tightly written, well illustrated, and virtually free of typographical errors, it will not meet the needs of the high-end experimentalist nor the student requiring a rigorous theoretical treatment of the spectroscopy itself. It does, however, nicely meet the needs of the much larger audience residing between these two extremes and is one of the better choices out there for relative newcomers seeking to apply the technique in their own particular analyses. ■

**Gary A. Baker**

12 June 2001



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