

Spectroscopic methods

Spectroscopic methods are the main tool of modern chemistry for the identification of molecular structures. In organic chemistry, spectroscopic methods are used to determine and confirm molecular structures, to monitor reactions and to control the purity of compounds. Most essential methods for the organic chemistry are the nuclear magnetic resonant spectroscopy (^1H) and ^{13}C NMR-spectroscopy, the mass spectrometry, the infrared and the UV/Vis-spectroscopy. In the following, frequently used German and English textbooks are listed, introducing the theory and applications of these methods on a basic course level.

Books about spectroscopic methods

Spektroskopische Methoden in der organischen Chemie

M. Hesse, H. Meier, B. Zeeh; Georg Thieme Verlag, 6th Edition (reviewed), 2002, ISBN 3-13-576106-1

Theory and application of UV/Vis-, IR-, Raman-, NMR-, mass spectrometry are expounded

Strukturaufklärung in der organischen Chemie

An introduction to spectroscopic methods

D. H. Williams, I. Fleming; Wiley-VCH, 6th Edition (reviewed), 1991, ISBN 3-527-30880-6

Spectrometric Identification of Organic Compounds

R. M. Silverstein, F. X. Webster,; John Wiley & Sons, 6th Edition, 1997, ISBN 0-471-13457-0,

A practice-near handbook about the identification of organic compounds on the basis of MS-, IR- and NMR-spectrometric measurements.

Optische Spektroskopie

W. Schmidt; Wiley-VCH, 2nd Edition, 2000, ISBN 3-527-29828,

Computer-Aided Structure Elucidation

Spectra interpretation and Structure generation

E. Pretsch, G. Toth, M. E. Munk, M. Badertscher, Wiley-VCH, 2002, ISBN 3-527-30640-4

With practical instruction and a software solution, it offers a good combination for the spectra analysis

Spectral Data for Structure Determination of Organic Compounds

E. Pretsch, P. Bühlmann, Ch. Affolter; Springer Verlag, 3rd Edition, 2000

Spectra Interpretation of Organic Compounds

E. Pretsch, J. - T. Clerc; Wiley-VCH, 1997, ISBN 3-527-28826-0

SpecTool: A Hypermedia Book for Structure Elucidation of Organic Compounds with Spectroscopic Methods

Gloor, M. Cadisch, R. B. Schaller, M. Farkas, T. Kocsis, J. - T. Clerc E. Pretsch R. Aeschmann, M. Badertscher, T. Brodmeier, A. Fürst, H.-J. Hediger, M. Junghans Hans, H. Kubinyi, M. E. Munk, H. Schriber, D. Wegmann,; Chemical Concepts, 1994

Aufgabensammlung zur Strukturaufklärung organischer Verbindungen mit spektroskopischen Methoden

E. Pretsch, J. Seibl, A. Manz, W. Simon, Springer Verlag, 1985, ISBN 3-540-15817-0

Modern Spectroscopy

J. M. Hollas; Wiley-VCH, 3rd Edition, 1996, ISBN 0-471-96523-5

NMR Spectroscopy

Basic Principles, Concepts and Applications in Chemistry

H. Günther; Wiley & Sons, 2nd Edition, 1995, ISBN 0-471-95201-X

Structure Elucidation by NMR in Organic Chemistry - A Practical Guide

E. Breitmaier; Wiley & Sons, 3rd Edition, 2002, ISBN 0-470-85007-8

150 and More Basic NMR Experiments - A practical Course

S. Braun, H.-O. Kalinowski, S. Berger; Wiley-VCH, 2nd Edition, completely reviewed and extended, 1998, ISBN 3-527-29512-7

Ein- und zweidimensionale NMR-Spektroskopie – Eine Einführung

H. Friebolin; Wiley-VCH, 3. Ed., 1999, ISBN 3-527-29514-3

Gives an introduction to all currently important NMR-techniques

Basic One - and Two-Dimensional NMR Spectroscopy

H. Friebolin; Wiley-VCH, 3rd Edition (reviewed), 1998, ISBN 3-527-30880-6

High resolution NMR Techniques in Organic Chemistry

Timothy D. W. Claridge; Pergamon, 1999, ISBN 0-08-042798-7

IR Spectroscopy – An Introduction

H. Günzler, H.-U. Gremlich; Wiley-VCH, 2002, ISBN 3-527-28896-1

Introduction in construction and handling of spectrometers, sample preparation, measurement and interpretation of spectra.

IR-Spektroskopie für Anwender

W. Gottwald, G. Wachter; Wiley-VCH, 1997, ISBN 3-527-28749-3

IR-Tutor in Organic View, CD-ROM in the textbook Organic Chemistry

G. Solomons, C. Fryhle, Wiley & Sons, 2000, 7th Edition, ISBN 0-471-19095-0

An interactive programme, that expounds and illustrates instrumentation and theory of the IR-spectroscopy.

UV/VIS-Spektroskopie für Anwender

W. Gottwald, K.H. Heinrich,; Wiley-VCH, 1998, ISBN 3-527-28760-4

Contains both the explanation of the theory as well as an introduction of the practical use of the method

Massenspektrometrie – Eine Einführung

H. Budzikiewicz; Wiley-VCH, 4th Edition (reviewed), 1998, ISBN 3-527-29381-7

Describes the procedures used in commercial appliances, the evaluation of the spectra and the interpretation of the data.

Mass Spectrometry - Principles and Applications

E. de Hoffmann, J. Charette, V. Stroobant; Wiley & Sons, 1996, ISBN 0-471-96697-5

Offers an overview over theoretical bases and important applications of modern mass spectrometry.

Also the instrumental equipment is described precisely.