Application Of Near Infrared Spectroscopy In Biomedicine

Near Infrared TechnologyNear-Infrared SpectroscopyHandbook of Near-Infrared AnalysisHandbook of Near-Infrared AnalysisNear-Infrared Spectroscopy in Food Science and TechnologyHandbook of Near-Infrared Analysis, Second EditionPharmaceutical and Medical Applications of Near-Infrared SpectroscopyApplication of Near Infrared Spectroscopy in BiomedicineImprovements of the Near-infrared Diffuse-reflectance TechniqueComparison of Mid and Near Infrared Diffuse Reflectance Analysis of Nitrocellulose ProductsNear Infrared Spectroscopy in Food AnalysisNear Infrared SpectroscopyAdvances in Near Infrared Spectroscopy and Related Computational MethodsPharmaceutical and Medical Applications of Near-Infrared Spectroscopy, Second EditionNear-Infrared Applications in BiotechnologyThe Clinical Applications of Near Infrared Spectroscopy (NIRS)Developments in Near-Infrared SpectroscopyNear and Mid Infrared Spectrometry for the Qualitative and Quantitative Analysis of Complex MaterialsNear-Infrared SpectroscopyHandbook of Near-Infrared Analysis, Second Edition Phil Williams Yukihiro Ozaki Donald A. Burns Emil W. Ciurczak Yukihiro Ozaki Donald A. Burns Emil W. Ciurczak Thomas Jue David E. Honigs Jyisy Yang B. G. Osborne Wilhelmus Nicolaas Josephus Maria Colier Christian Huck Emil W. Ciurczak Ramesh Raghavachari Richard D. Cowley Konstantinos Kyprianidis Jill Marie Olinger Heinz W. Siesler Donald A. Burns

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imagine an analytical technique that uses no chemicals gives accurate and precise results in minutes or even continuously and is simple to install and safe to use near infrared spectroscopy nirs supplies this dream this book covers all of the essential features for successful nirs application in a practical and easily understandable format the driving force behind compiling this book is to provide knowledge on all aspects of nirs to potential users and to users who would like to delve a little deeper into the technology we have assembled the book mainly to help in the application of near infrared nir instruments and technology in industry

this book provides knowledge of the basic theory spectral analysis methods chemometrics instrumentation and applications of near infrared nir spectroscopy not as a handbook but rather as a sourcebook of nir spectroscopy thus some emphasis is placed on the description of basic knowledge that is important in learning and using nir spectroscopy the book also deals with applications for a variety of research fields that are very useful for a wide range of readers from graduate students to scientists and engineers in both academia and industry for readers who are novices in nir spectroscopy this book provides a good introduction and for those who already are familiar with the field it affords an excellent means of strengthening their knowledge about nir spectroscopy and keeping abreast of recent developments

fast inexpensive and easy to use near infrared nir spectroscopy can be used to analyze small samples of virtually any composition the handbook of near infrared analysis third edition explains how to perform accurate as well as time and cost effective analyses across a growing spectrum of disciplines presenting nearly 50 new and re

rapid inexpensive and easy to deploy near infrared nir spectroscopy can be used to analyze samples of virtually any composition origin and condition the handbook of near infrared analysis fourth edition explores the factors necessary to perform accurate and time and cost effective analyses across a growing spectrum of disciplines this updated and expanded edition incorporates the latest advances in instrumentation computerization chemometrics applied to nir spectroscopy and method development in nir spectroscopy and underscores current trends in sample preparation calibration transfer process control data analysis instrument performance testing and commercial nir instrumentation this work offers readers an unparalleled combination of theoretical foundations cutting edge applications and practical experience additional features include the following explains how to perform accurate as well as time and cost effective analyses reviews software enabled chemometric methods and other trends in data analysis highlights novel applications in pharmaceuticals polymers plastics petrochemicals textiles foods and beverages baked products agricultural products biomedicine nutraceuticals and counterfeit detection underscores current trends in sample preparation calibration transfer process control data analysis and multiple aspects of commercial nir instrumentation offering the most complete single source guide of its kind the handbook of near infrared analysis fourth edition continues to offer practicing chemists and spectroscopists an unparalleled combination of theoretical foundations cutting edge applications and detailed practical experience provided firsthand by more than 50 experts in the field

this reference gives food science professionals a working understanding of near infrared spectroscopy nirs and its role in maximizing food potential it explains the technical aspects of nirs including basic principles characteristics of the nir spectra instrumentation sampling techniques and chemometrics the book details applications of nirs in agricultural and marine products foodstuffs and processed foods engineering and process monitoring and food safety and disease diagnosis

with contributions from over 40 experts in the field this reference presents comprehensive single source coverage of the instrumentation computerization calibration and methods development of nir spectroscopy it provides novel applications for accurate time and cost effective analyses of pharmaceuticals polymers textiles agricultural products dairy products foods and beverages emphasizing trends in sample preparation the book covers historical development calibration transfer biomedical applications plastics and counterfeiting on line in line and at line analyses for process control multilinear regression and principal component analysis and more

this book discusses the theory instrumentation validation and implementation of near infrared spectroscopy for pharmaceutical and medical applications it showcases a diverse range of contemporary methods for the production screening and analysis of new drug products and pharmaceuticals presents current approaches in near infrared spectroscop

in the last few decades near infrared nir spectroscopy has distinguished itself as one of the most rapidly advancing spectroscopic techniques mainly known as an analytical tool useful for sample characterization and content quantification nir spectroscopy is essential in various other fields e g nir imaging techniques in biophotonics medical applications or used for characterization of food products its contribution in basic science and physical chemistry should be noted as well e g in exploration of the nature of molecular vibrations or intermolecular interactions one of the current development trends involves the miniaturization and simplification of instrumentation creating prospects for the spread of nir spectrometers at a consumer level in the form of smartphone attachments a breakthrough not yet accomplished by any other analytical technique a growing diversity in the related methods and applications has led to a dispersion of these contributions among disparate scientific communities the aim of this special issue was to bring together the communities that may perceive nir spectroscopy from different perspectives it resulted in 30 contributions presenting the latest advances in the methodologies essential in near infrared spectroscopy in a variety of applications

since the completion of the first edition of this book major developments have occurred in the pharmaceutical industry that have shaped the field of near infrared nir spectroscopy a new initiative from the u s food and drug administration fda to modernize regulations of pharmaceutical manufacturing and drug quality has helped position nir spectroscopy as an effective tool for pharmaceutical testing pharmaceutical and medical applications of near infrared spectroscopy second edition reflects these developments and brings readers an up to date summary of how this technique is being applied to pharmaceutical manufacturing topics include the origins and principles of nir spectroscopy including early instrumentation spectroscopic theory and light particle

interaction the physics of each instrument type the strengths and weaknesses of each and the manufacturers that produce them the possible advantages of using nir methods for monitoring or controlling blending as well as practical concerns for mixing processes nir spectroscopy as applied to traditional granulation drug layering and film coating of beads or granules pharmaceutical assays including qualitative analysis quantitative analysis determination of actives in tablets and capsules and considerations for intact dosage form analysis steps involved in the validation and acceptance of an nir spectroscopy method including quality assurance qualification and verification of instruments and the international conference on harmonization ich guidelines medical applications including those related to blood glucose measurements tissue and major organ analysis fetal analysis and cancer research providing comprehensive coverage of nir spectroscopy from theory mathematics application and mechanics of nir analysis the book supplies ample references to facilitate further research into this burgeoning field

this volume explores developments in techniques in diagnostics dna sequencing bioanalysis of immunoassays and single molecule detection it promotes the measurement identification monitoring analysis and application of near infrared spectroscopy nir to medical and pharmaceutical advances the text also considers noninvasive methods of nir for successful cost effective and prompt diagnoses of diseases

over the past few decades exciting developments have taken place in the field of near infrared spectroscopy nirs this has been enabled by the advent of robust fourier transform interferometers and diode array solutions coupled with complex chemometric methods that can easily be executed using modern microprocessors the present edited volume intends to cover recent developments in nirs and provide a broad perspective of some of the challenges that characterize the field the volume comprises six chapters overall and covers several sectors the target audience for this book includes engineers practitioners and researchers involved in nirs system design and utilization in different applications we believe that they will greatly benefit from the timely and accurate information provided in this work

over the last few years near infrared nir spectroscopy has rapidly developed into an important and extremely useful method of analysis in fact for certain research areas and applications ranging from material science via chemistry to life sciences it has become an indispensable tool because this fast and cost effective type of spectroscopy provides qualitative and quantitative information not available from any other technique this book offers a balanced overview of the fundamental theory and instrumentation of nir spectroscopy introducing the material in a readily comprehensible manner a considerable part of the text is dedicated to practical applications including sample preparation and investigations of polymers textiles drugs food and animal feed however special topics such as two dimensional correlation analysis are also covered in separate chapters written by eight experts in different fields this book presents an introduction to the current state of developments and is valuable to spectroscopists and to practitioners applying nir spectroscopy as a daily analytical tool

with contributions from over 40 experts in the field this reference presents comprehensive single source coverage of the instrumentation computerization calibration and methods development of nir spectroscopy it provides novel applications for accurate time and cost effective analyses of pharmaceuticals polymers textiles agricultural products dairy products foods and beverages emphasizing trends in sample preparation the book covers historical development calibration transfer biomedical applications plastics and counterfeiting on line in line and at line analyses for process control multilinear regression and principal component analysis and more

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