

Application Of Near Infrared Spectroscopy In Biomedicine

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Application Of Near Infrared Spectroscopy

Near-infrared spectroscopy (NIRS) is a spectroscopic method that uses the near-infrared region of the electromagnetic spectrum (from 780 nm to 2500 nm). Typical applications include medical and physiological diagnostics and research including blood sugar, pulse oximetry, functional neuroimaging, sports medicine, elite sports training, ergonomics, rehabilitation, neonatal research, brain ...

Near-Infrared (NIR) Spectroscopy | OSRAM

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Application of Near Infrared Spectroscopy in Biomedicine ...

Near infrared (NIR) spectroscopy enjoys increasing popularity in food science. ▯ Presentation of general aspects of NIR spectroscopy in food analysis. ▯ Versatility of applications is shown. ▯ On-line applications are discussed. ▯ Laboratory, semi-industrial, and industrial applications are classified.

Near-infrared spectroscopy - Wikipedia

Near-infrared spectroscopy is routinely utilized for the analyses of nitrogen, moisture, fibre, structural carbohydrates, amino acids and minerals for forage quality (Cozzolino et al. 2001, Fontaine et al. 2001, Andrés et al. 2005) and plant breeding programmes (Font et al. 2006, Campo et al. 2013, Dreccer et al. 2014, Meng et al. 2015).

On-line application of near infrared (NIR) spectroscopy in ...

Near infrared (NIR) spectroscopy is a fast, ... Schulz, H., Drews, H.H., Quilitzsch, R. and Krüger, H. ▯Application of near infrared spectroscopy for the quantification of quality parameters in selected vegetables and essential oil plants ...

APPLICATIONS OF IR SPECTROSCOPY | PharmaTutor

The applicability of near-infrared (NIR) and mid-infrared (MIR) spectroscopy combined with chemometrics was explored in this study to develop rapid, low-cost and non-destructive spectroscopic ...

Clinical Applications of Near-Infrared Spectroscopy in ...

Functional near-infrared spectroscopy (fNIRS), a growing neuroimaging modality, has been utilized over the past few decades to understand the neuronal behavior in the brain. The technique has been used to assess the brain hemodynamics of impaired cohorts as well as able-bodied.

Near Infrared Spectroscopy: fundamentals, practical ...

Nevertheless, despite the mathematical treatment applied to the spectra, visible/near-infrared (Vis-NIR) spectroscopy was suitable only for rough screening purposes for moisture content and unsatisfactory for protein and intramuscular fat content predictions, according to the criteria established by Williams. 24,25 These results could have been due to the small range of values for protein ...

Application of near-infrared spectroscopy for estimation ...

1. Introduction. In recent years, near-infrared spectroscopy (NIR) has been widely used for the analysis of characteristics with rapid analysis speed and low cost [, ,].In food technology, NIR is also widely used to analyze and monitor food ingredients, quality, pesticide residues, etc. [,].For cereal science, Shen et al. [] developed a method for rapid analysis and quantification of ...

Application of deep learning and near infrared ...

Near-infrared transmittance spectroscopy combined with multivariate chemometric was investigated in the present work to predict the Polarization (Pol), soluble solids content (brix), sucrose ...

Near-Infrared Spectroscopy | Wiley Online Books

Infrared spectroscopy is widely used in industry as well as in research. It is a simple and reliable technique for measurement, quality control and dynamic measurement. It is also employed in forensic analysis in civil and criminal analysis. Some of the major applications of IR spectroscopy are as follows: 1.

Application of functional near-infrared spectroscopy in ...

Near-infrared (NIR) spectroscopy combined with chemometrics was used as a technique to predict the potato flour content in Chinese steamed bread (CSB). The inner core of CSB was chosen as the measuring position for acquiring the NIR spectra. Spectra between 4000 and 10,000 cm⁻¹ were analysed using a partial least-squares regression. The coefficient of determination (R² CV 2) and the ...

Review: The Application of near Infrared Spectroscopy to ...

1. Introduction and Historical Overview. Near Infrared Spectroscopy (NIR) is a type of vibrational spectroscopy that employs photon energy (hν) in the energy range of 2.65 x 10⁻¹⁹ to 7.96 x 10⁻²⁰ J, which corresponds to the wavelength range of 750 to 2,500 nm (wavenumbers: 13,300 to 4,000 cm⁻¹).This energy range is higher than necessary to promote molecules only to their lowest excited ...

(PDF) Application of near infrared spectroscopy in the ...

In this review, applications of near-infrared photoacoustic spectroscopy are presented as an opportunity to evaluate human respiration because the measurement of breath is fast, intact and simple to implement. Recently, analytical methods for measuring biomarkers in exhaled air have been extensively developed. With laser-based photoacoustic spectroscopy, volatile organic compounds can be ...

A Review of the Principles and Applications of Near ...

Near-infrared Spectroscopy (NIR) has the power to transform industries as it enables producers and consumers to analyze materials without the use of complex measurement equipment. The broad range of possible applications includes the areas of agriculture, retail, medical as well as mobile devices like smart phones and tablets.

Application of near-infrared spectroscopy for screening ...

Professor Siesler is a recipient of the EAS Award, the Tomas Hirschfeld Award and the Buechi Award in near-infrared spectroscopy and he is a Fellow of the Society for Applied Spectroscopy. His main research focuses on the application of vibrational spectroscopy to chemical and polymer research, analysis and quality control, and he has authored more than 230 publications in this field.

Applications of Portable Near-Infrared Spectroscopy

Abstract Near-infrared spectroscopy (NIRS) can monitor regional cerebral oxygen saturation (rScO₂), mostly representing oxygen supply to the brain. The ratio between rScO₂ and systemic oxygen saturation (SaO₂) estimates cerebral fractional tissue oxygen extraction (cFTOE), reflecting oxygen utilization. The balance between oxygen supply and utilization provides insight into neonatal ...

Applications of Near Infrared Photoacoustic Spectroscopy ...

In keeping with the style of the Handbook of Modern Biophysics, this fourth volume, Application of Near-Infrared Spectroscopy in Biomedicine, balances the need for physical science/mathematics formalism with a demand for biomedical perspectives.

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