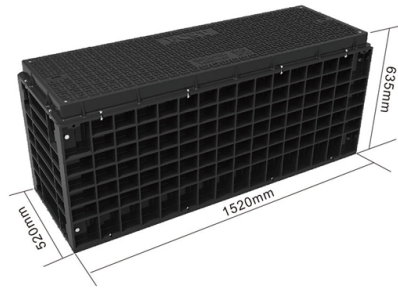


Principle of pH Measurement Using Fiber Optic Sensors with Polyaniline



Article Overview

Polyaniline-coated fiber optic sensors measure pH by detecting changes in the polymer's refractive index or optical absorption in response to protonation/deprotonation, which modulates the transmitted or reflected light signal.

Sensing Mechanism

Polyaniline (PANI) is a pH-sensitive conducting polymer whose optical properties change with the surrounding hydrogen ion concentration. When PANI is coated onto an optical fiber, either as a thin film or via surface polymerization, the protonation state of the polymer changes with pH, altering its refractive index and absorption spectrum. These changes affect the light propagating through the fiber, either by modulating the evanescent field in unclad or side-polished fibers or by shifting the interferometric fringes in microfiber sensors .

Optical Transduction

- Surface Plasmon Resonance (SPR) Approach: A thin metal layer (e.g., platinum) is deposited on the fiber, followed by a PANI coating. Changes in PANI's refractive index with pH modify the SPR conditions, leading to measurable shifts in resonance wavelength or intensity .
- Interferometric Approach: In microfiber or trenched core-free fibers, the PANI layer interacts with the evanescent field. pH-induced refractive index changes cause wavelength shifts in the interference pattern, which can be precisely measured .
- Transmission/Absorption Monitoring: The optical power transmitted through the fi...

Article Content

Comparative Study of pH Sensors Based on PANi-coated Specialty

In this paper, we report the analysis of a novel optical fiber pH sensor based in polyaniline coating applied on a

Sensitive pH Monitoring Using a Polyaniline-Functionalized Fiber Optic ...

The proposed FO-SPR sensor could be used for biomedical applications, environmental monitoring or any remote, real-time on-site

Fast response microfiber-optic pH sensor based on a polyaniline

The microfiber-optic interferential sensor based on polyaniline (PANI) sensing layer is efficiently performed in pH detection. The

A wide range and highly sensitive optical fiber pH sensor using ...

Abstract In the present study we report the fabrication and characterization of no-core fiber sensor (NCFS) using smart

Low-Cost Optical pH Sensor with a Polyaniline (PANI)-Sensitive

Pyroscience sells two types of optical sensors: fixed fiber pH mini-sensor and pH sensors spot. They are

Polyaniline-coated tilted fiber Bragg gratings for pH sensing

Optical and fiber-optic pH sensors complement the glass electrodes for pH monitoring and offer numerous advantages

Plastic Optical Fiber pH Sensor Using a Sol-Gel Sensing Matrix

The earliest methods of pH measurement fall roughly into four categories: indicator reagents, pH test strips, amperometric or

A Flexible Optical pH Sensor Based on Polysulfone Membranes

A new optical pH sensor based on polysulfone (PSU) and polyaniline (PANI) was developed. A transparent and

PANI-PVA composite film coated optical fiber probe as a stable and ...

Abstract An intrinsic optical fiber pH sensor coated with polyaniline (PANI)-polyvinyl alcohol (PVA) composite layer is

Tilted fiber Bragg grating pH sensor based on polyaniline reaction ...

In this paper, we propose a tilted fiber Bragg grating (TFBG) pH sensor based on polyani-line (PANI) reactive deposition film.

Optical Sensing and Imaging of pH Values: Spectroscopies, Materials ...

This is the first comprehensive review on methods and materials for use in optical sensing of pH values and on

An improved optical pH sensor based on polyaniline

By using optical fibers, the optical beam can be transported over a long distance, allowing remote sensing to be

Optical Fiber pH Sensors Based on PAni-Coated Microstructured

In this article, we report the analysis of a novel optical fiber pH sensor based in polyaniline (PAni) coating applied on a

Advancements in Optical Fiber Sensors for pH Measurement:

Measuring pH is a critical parameter in environmental monitoring, biomedical diagnostics, food safety, and industrial processes.

(PDF) Critical review of pH sensing with optical fibers

A critical analysis of the state of art in pH sensing using optical fibers is described, outlining the advantages and

(PDF) Fiber-Optic pH Sensor

PDF | The new enhancement in the determination of pH using optical fiber system is described here. This work uses

Advanced hydrogel optical fiber sensors with triple-readout for real ...

Herein, we have developed hydrogel-based optical fiber (OF) sensors for continuous and real-time pH sensing using a

pmc.ncbi m.nih.gov

Hier sollte eine Beschreibung angezeigt werden, diese Seite lässt dies jedoch nicht zu.

Optical Fibre-Based Sensors—An Assessment of Current Innovations

Optical fibre sensors are an essential subset of optical fibre technology, designed specifically for sensing and

Sensitive pH Monitoring Using a Polyaniline-Functionalized Fiber Optic ...

Sensitive pH Monitoring Using a Polyaniline-Functionalized Fiber Optic—Surface Plasmon Resonance Detector Iulia Antohe 1, Luiza

Optical fiber F-P cavity pH sensor based on polyaniline reaction ...

This paper combines the internal refractive index characteristics of the optical fiber Fabry-Perot (F-P) cavity and the

Fiber-optic probes for real-time pH monitoring

Fiber-optic sensors provide real-time monitoring, showcasing the robustness of pH sensors in challenging

Sensitive pH Monitoring Using a Polyaniline-Functionalized Fiber

In this work, we report results on the fabrication and characterization of a surface plasmon resonance (SPR) pH sensor using

Low-Cost Optical pH Sensor with a Polyaniline (PANI)-Sensitive

The resulting PANI layer has excellent stability, resistance to solvents, and bio- and chemical compatibility. The pH

SPR based fiber optic pH sensor using polyaniline as a sensing layer ...

In this context, fiber optic-surface plasmon resonance (FO-SPR) pH sensors have attracted increasing interests due

An improved optical pH sensor based on polyaniline

The main goal of the present research was to develop stable polyaniline for use in an optical pH sensor. We found

Contact Us

For more information, pricing, or custom solutions, please contact us:

Website: <https://thebucketlistbook.co.za>

Email: sales@thebucketlistbook.co.za

Phone: +33 1 42 78 39 16

Address: 10 Rue de la Paix, 75002 Paris, France

This document is for informational purposes only. Specifications subject to change without notice.

