Fiber Optic Acetylene Sensor

Overview

The microstructured optical fiber (MOF) is specially designed to have a photosensitive core and holey cladding for grating fabrication and gas detection. The micro-holes of the MOF serve as gas cells, in which the acetylene molecules interact with light through the. Project aims to develop a real-time, low-cost, fiber-based tool for monitoring dissolved gas species in transformer oil. To develop fiber sensors for targeted detection of relevant gas species (especially acetylene, for detection of discharge faults). The gas diffused into the. Early fault detection in oil-filled power transformers is an important factor in improving the stability and reliability of the electrical grid. Faults typically result from high-temperature degradation of the mineral oil, either by operation above temperature specification or through localized.

Article Content

Optical Fiber Sensors for Selective Detection of Acetylene ...

To develop fiber sensors for targeted detection of relevant gas species (especially acetylene, for detection of discharge faults). Use AI/ML tools to map fiber data to identification of transformer ...

Silicon-Cantilever-Enhanced Single-Fiber Photoacoustic Acetylene ...

A single-fiber photoacoustic (PA) sensor with a silicon cantilever beam for trace acetylene (C2H2) gas analysis was proposed. The miniature gas sensor mainly consisted of a microcantilever and a non ...

Part-per-Billion (Ppb)-Level Acetylene Sensor Employing Optical ...

An all-optical double-pass quartz enhanced photoacoustic spectroscopy (QEPAS) sensor for the detection of acetylene (C 2 H 2) at part-per-billion (ppb) levels was developed and ...

Fiber-Optic Acetylene Gas Sensor Based on ...

A fiber-optic acetylene gas sensor based on a microstructured optical fiber Bragg grating (MOFBG) is presented. The microstructured optical fiber (MOF) is specially designed to have a...

Simultaneous High-Sensitivity and Rapid-Response Acetylene ...

In this work, we report a simultaneous high-sensitivity and rapid-response acetylene (C 2 H 2) sensor enabled by a novel 3D-printed single-fiber photoacoustic probe.

Cantilever-enhanced fiber-optic photoacoustic sensor for trace gas ...

A cantilever-enhanced fiber-optic photoacoustic sensor with pressure self-compensation is reported to address reduced detection accuracy in plateau regions for trace acetylene detection.

Sensing materials for optical fiber-based selective detection of acetylene

Several different material systems are investigated for detection of acetylene, as well as other hydrocarbons relevant to mineral oil degradation within transformers.

All-Optical Photothermal Spectroscopy for Multipoint Acetylene ...

This article presents a novel multipoint acetylene (C2H2) sensing technology based on fiber-optic photothermal spectroscopy (PTS). The system employs a series of miniature PT sensors with ...

Fiber-optic acetylene gas sensor based on microstructured optical ...

A fiber-optic acetylene gas sensor based on a microstructured optical fiber Bragg grating (MOFBG) is presented. The microstructured optical fiber (MOF) is specially designed to have a photosensitive ...

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