Humidity sensor based on tapered single mode fiber coated with a hydroxyethyl cellulose/poly-vinylidene fluoride composite

By: Lokman, A (Lokman, A.¹); Batumalay, M (Batumalay, M.¹); Harun, SW (Harun, S. W.²); Arof, H (Arof, H.¹)

UKRAINIAN JOURNAL OF PHYSICAL OPTICS
Volume: 15 Issue: 2 Pages: 96-101
Published: 2014

Abstract
A simple humidity sensor is suggested basing on a tapered single-mode fibre coated with a mixed polymer composite hydroxyethyl cellulose/polyvinylidene fluoride. The tapered fibre produced by an etching technique and coated with a humidity-sensitive cladding creates intermodal interference which enables detecting humidity changes. The performance of the sensor is studied for the two fibre diameters, 50 and 87.5 μm. As the relative humidity increases, the interference spectrum shifts towards longer wavelengths. The highest sensitivity, 0.0116 nm/%, is obtained at the smallest tapered-fibre diameter of 50 μm, with the linearity being more than 98.20%.

Keywords
Author Keywords: fibre-optic sensors; humidity sensors; relative humidity; hydroxyethyl cellulose/polyvinylidene fluoride
KeyWords Plus: MICROFIBER

Author Information
Reprint Address: Lokman, A (reprint author)
Univ Malaya, Fac Engn, Dept Elect Engn, Kuala Lumpur 50603, Malaysia.

Addresses:
[¹] Univ Malaya, Fac Engn, Dept Elect Engn, Kuala Lumpur 50603, Malaysia
[²] Univ Malaya, Fac Engn, Dept Elect Engn, Kuala Lumpur 50603, Malaysia

Publisher
INST PHYSICAL OPTICS, 23 DRAGOMANOV STR, LVIV, 79005, UKRAINE

Categories / Classification
Research Areas: Optics
Web of Science Categories: Optics

Document Information
Document Type: Article
Language: English
Accession Number: WOS:000336079100005
ISSN: 1609-1833

0 Times Cited
8 Cited References
View Related Records
View Citation Map
Create Citation Alert
Journal Information

Impact Factor: Journal Citation Reports®

Other Information

IDS Number: AH4EH
Cited References in Web of Science Core Collection: 8
Times Cited in Web of Science Core Collection: 0