

Fiber Bragg grating assisted surface plasmon resonance sensor with graphene oxide sensing layer

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Abstract

A single mode fiber Bragg grating (FBG) is used to generate Surface Plasmon Resonance (SPR). The uniform gratings of the FBG are used to scatter light from the fiber optic core into the cladding thus enabling the interaction between the light and a thin gold film in order to generate SPR. Applying this technique, the cladding around the FBG is left intact, making this sensor very robust and easy to handle. A thin film of graphene oxide (GO) is deposited over a 45 nm gold film to enhance the sensitivity of the SPR sensor. The gold coated sensor demonstrated high sensitivity of approximately 200 nm/RIU when tested with different concentrations of ethanol in an aqueous medium. A 2.5 times improvement in sensitivity is observed with the GO enhancement compared to the gold coated sensor. © 2016 Published by Elsevier B.V.

Author keywords

Ethanol; Fiber Bragg grating; Gold; Graphene oxide; Surface plasmon resonance

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