

Absorbance response of graphene oxide coated on tapered multimode optical fiber towards liquid ethanol

ABSTRACT

The investigation of graphene oxide (GO) for sensing applications is attractive due to its nanoscale structure and its sensing properties has yet to be fully understood. In this paper, optical response of GO coated optical fiber sensor towards ethanol is described. GO was coated onto a multimode tapered optical fiber by drop-casting technique. The coated fiber was exposed to 5–40% of ethanol in water. The films were characterized with field emission scanning electron microscope, ultraviolet-visible spectroscopy and Raman spectroscopy. The sensing is based on changes following the absorbance of the GO coated optical fiber upon exposure to ethanol. The developed sensor shows fast response and recovery with duration of 22 and 20 s, respectively. The sensor also displays high repeatability and reversibility.

Keyword: Absorbance; Ethanol; Graphene oxide; Optical fiber sensor; Tapered fiber