

## **Silver/graphene nanocomposite-modified optical fiber sensor platform for ethanol detection in water medium**

### **ABSTRACT**

A silver nanoparticle-incorporated reduced graphene oxide (Ag/rGO) nanocomposite-based tapered optical fiber sensor was successfully fabricated for the sensing of ethanol in an aqueous medium. The sensor probe was fabricated by using a drop-casting technique to coat Ag/rGO on a multimode tapered optical fiber, and the dynamic response was investigated under an exposed condition for ethanol in an aqueous medium. The operating principle of the sensor device was based on the spectral intensity interrogation technique in the visible region. The visible region spectral intensity was found to vary linearly with the ethanol content in the range of 1–100%. The high sensitivity, rapid response, and good stability of the Ag/rGO nanocomposite-based optical fiber sensor make it a potential candidate for monitoring environmental pollution and the safety requirements of industry and daily life.

**Keyword:** Silver nanoparticles; Graphene; Nanocomposite; Optical fiber sensor; Ethanol sensor