

## **Room temperature ammonia sensing using tapered multimode fiber coated with polyaniline nanofibers**

### **ABSTRACT**

We demonstrate an ammonia sensor composed of a tapered multimode fiber coated with polyaniline nanofibers that operates at room temperature (26°C). The optical properties of the polyaniline layer changes when it is exposed to ammonia, leading to a change in the absorption of evanescent field. The fiber sensor was tested by exposing it to ammonia at different concentrations and the absorbance is measured using a spectrophotometer system. Measured response and recovery times are about 2.27 minutes and 9.73 minutes, respectively. The sensor sensitivity can be controlled by adjusting the tapered fiber diameter and the highest sensitivity is achieved when the diameter is reduced to 20  $\mu$ m.

**Keyword:** Ammonia sensor; Tapered fiber; Fiber sensor; Room temperature; Absorbance