

Gasochromic response of optical sensing platform integrated with polyaniline and poly(3,4-ethylenedioxythiophene) exposed to NH₃ gas

ABSTRACT

The optical NH₃ gas sensing performance of polyaniline (PANI) and poly(3,4-ethylenedioxythiophene (PEDOT) in the form of bilayers and copolymers was analysed in this study. The order of the bilayers and the presence of acid dopant on the fabrication of the sensing platform produced different absorbance responses upon exposure to NH₃ gas. The limit of detection of the bilayer (PANI(aq.)/PEDOT(aq.)) was 7.86 ppm which is under the threshold limit value of NH₃, with response and recovery times of 2.33 min and 46.8 s, respectively. The gasochromic behaviour of PANI and PEDOT during the adsorption of NH₃ gas was closely related to the changes in the oxidation state which have simultaneously altered the colour intensity of the respective sensing layer.

Keyword: Gasochromism; Optical NH₃ gas sensor; Conducting polymers