

Optical ammonia gas sensor of poly(3,4-polyethylenedioxythiophene), polyaniline and polypyrrole: a comparative study

ABSTRACT

In this work, the optical sensing performance of three different types of conducting polymers, polyaniline (PANI), poly(3,4-ethylenedioxythiophene) (PEDOT) and polypyrrole (PPy) towards ammonia (NH₃) gas has been evaluated. The sensing analyses of the respective conducting polymers were measured in the optimised wavelength ranges that manifest absorbance response upon exposure to NH₃ gas. Based on the dynamic response where the respective conducting polymers were exposed to NH₃ gas within the concentration range of 0.0625 % to 1 %, PEDOT exhibited the highest sensitivity (9.03/%) towards NH₃ gas comparing to PANI and PPy with the detection limit of 2.73 ppm, which is in agreement with their respective conductivity trends.

Keyword: Optical gas sensor; Ammonia gas sensor; Conducting polymers