

Effect of Fiber Structure on Gas Sensing Properties of Polyaniline Coated on Single Yarn

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In this study, we report the influence of textile substrates upon the behavior of electrical and gas sensing properties of polyaniline (PANi) coated on the commercially single yarn. The sensing devices were prepared by dip coating of PANi on various kinds of yarn structure including cotton, viscose rayon and polyester. Sensor fabrication parameters which included precursor, reagent and acidity doping concentrations have been studied. The results showed that the PANi can easily coated on cotton and viscose rayon yarns as indicated electrical resistance of 28 ± 7 and 47 ± 9 k Ω /cm, respectively, while it hardly coated on polyester substrate as indicated resistance greater than 200 M Ω /cm. The resulting PANi-based textile sensors were found to be highly selective to ammonia gas with linearly dependence on gas concentrations. Furthermore, the sensor can identify level of ammonia gas as low as 5 ppm with fast response time.

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