

عنوان مقاله:

INVESTIGATION OF SUBSTRATE EFFECT ON THE RESPONSE BEHAVIOR OF FABRICATED GAS SENSOR BASED ON NANOSTRUCTURE VAPOR DEPOSITION SYNTHESIZED POLYPYRROLE

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خلاصه مقاله:

Many types of fiber sensors have been developed in the past decade, including fiber optic, piezoelectric, and electrically conducting sensors 1, 2. Polymer-based gas sensors have received considerable interest in recent years, mainly due to their gas sensing ability, by measuring the conductivity changes as a function of the polymer doping by gases. In this work electrically conductive fibers have been prepared by vapor polymerization of pyrrole on surfaces of commercial polymer fibers as hydrophile substrate and Teflon fibers as hydrophobe substrate in the presence of Cl⁻ as an anion dopant. The resistance of polypyrrole coated fiber sensor (PPy-CFS) investigated and related to coating conditions, which was controlled by adjusting the reactant vapor polymerization time and dopant concentration effect. The morphology of the conducting film on the surface of the fibers was examined by scanning electron microscope (SEM), indicating a strong dependence of the substrate type. The sensing of volatile organic compounds was studied experimentally. Effects of substrate in polymerization of pyrrole and absorption of organic molecules on the sensor surface and response behavior were investigated. The PPy-CFS had demonstrated fast response time (<1s), sensitivity of sensors with different substrate was different for the same compounds.

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