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Sensing Property of Poly-Aniline Thin Films Doped with HCl for Ammonia Detection at Room Temperature

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ABSTRACT

In the work presented here, the conducting polymer polyaniline thin films were in-situ synthesized by chemical polymerization. The Polyaniline (PANI) thin films were formed by using chemical bath deposition technique. The physico-chemical characterization of prepared conducting polymer has been done with UV-Visible and FTIR spectroscopy. FTIR spectroscopy reveals chemical details about formation of Polyaniline and the electrical characterization gives the conductivity of the thin films. The value of conductivity of polyaniline film obtained by us is in very good agreement with the available reported data base. The prepared polyaniline thin film is used as an active layer in bio-sensors to sense ammonia. The electrical conductivity of polyaniline shows significant change when in contact with ammonia vapours. As the concentration of ammonia vapour increases the resistance is found to increase. Several orders of magnitude of change in resistance was observed upon chemical doping and dedoping of the polyaniline, when expose to the ammonia. This large conductivity variation range can be utilized to make sensitive chemical sensors. It has been observed that these films are selective for ammonia gas. Hence polyaniline films can be used as ammonia sensors at room temperature.

Keywords

Polyaniline, CBD, Ammonia sensing

