

Effect of Using a Mixture of Al₂O₃ Nanoparticles and 3-Aminopropyltriethoxysilane as the Sensing Membrane for Polysilicon Wire on pH Sensing

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Abstract : In this work, a polysilicon wire (PSW) coated with a mixture of 3-aminopropyltriethoxysilane (r-APTES) and Al₂O₃ nanoparticles as the sensing membrane prepared with various Al₂O₃/r-APTES and dispersing agent/r-APTES ratios for pH sensing is studied. The r-APTES and dispersed Al₂O₃ nanoparticles mixture was directly transferred to PSW surface by solution phase deposition (SPD). It is found that using a mixture of Al₂O₃ nanoparticles and r-APTES as the sensing membrane help in improving the pH sensing of the PSW sensor and a 5 min SPD deposition time is the best. Dispersing agent is found to be necessary for better pH sensing when preparing the mixture of Al₂O₃ nanoparticles and r-APTES. The optimum condition for preparing the mixture is found to be Al₂O₃/r-APTES ratio of 2% and dispersing agent/r-APTES ratio of 0.3%.

Keywords : al₂o₃ nanoparticles, ph sensing, polysilicon wire sensor, r-aptres

Conference Title : ICNB 2015 : International Conference on Nanotechnology and Biosensors

Conference Location : Prague, Czechia

Conference Dates : July 09-10, 2015