A Humidity Sensing Organic-Inorganic Composite for Environmental Monitoring

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Received: 20 January 2013; in revised form: 10 March 2013 / Accepted: 10 March 2013 / Published: 14 March 2013

Abstract: In this paper, we present the effect of varying humidity levels on the electrical parameters and the multi frequency response of the electrical parameters of an organic-inorganic composite (PEPC+NiPe+Cu2O)-based humidity sensor. Silver thin films (thickness ~200 nm) were primarily deposited on plasma cleaned glass substrates by the physical vapor deposition (PVD) technique. A pair of rectangular silver electrodes was formed by patterning silver film through standard optical lithography technique. An active layer of organic-inorganic composite for humidity sensing was later spun coated to cover the separation between the silver electrodes. The electrical characterization of the sensor was performed as a function of relative humidity levels and frequency of the AC input signal. The sensor showed reversible changes in its capacitance with variations in humidity level. The maximum sensitivity ~31.6 pF/%RH at 100 Hz in capacitive mode of operation has been attained. The aim of this study was to increase the sensitivity of the previously reported humidity sensors using PEPC and NiPe, which has been successfully achieved.