

Electrochemical impedance spectroscopy study of Si nanorods for humidity sensing

Ruohong Cai

In this project, Electrochemical Impedance Spectroscopy is used to study the performance of nanorods in humidity sensing. A sample with Si nanorods deposit on silicon wafer is prepared by GLAD. Ag film is deposit on Si nanorods as electrodes by PVD75. A gap is left between the electrodes to expose the nanorods. DI water is heated to give off vapor which creates the humidity environment. Electrochemical Impedance Measurements in the frequency range from 3M to 0.1 Hz are presented for the sample under different relative humidity conditions. Finally, an equivalent circuit model is implemented and fitted to the experimental results for the determination of the experimental resistance and capacitance. On the other hand, the evolution of the EIS spectra under different relative humidity is compared in order to identify the sensitivity of nanorods for sensing application. Furthermore, this sample can be applied for the sensing studies of other materials.