

“Dielectric and electrical performance of poly (o-toluidine) based MOS devices”

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Abstract

Here, the electrical and dielectric characteristics of Poly (o-toluidine)/SiO₂/p-Si metal oxide semiconductor (MOS) device were investigated. The J-V and C-F of the prepared MOS structures were explored in the temperature range of 300–400 K and frequency of 1 KHz-10MHz under dark condition. The charge transport in MOS device was found to obey thermionic emission phenomena and the device exhibited a rectify property. Electrical parameters including, barrier height, states density, ideality factor and series resistance were studied and estimated as a function of temperature. The density of states and the series resistance were decreased with raising temperature which was ascribed to the rearrangement and restructuring of the interfaces. In addition, the dielectric properties of the MOS device were studied. It was found that, the dielectric constant and dielectric loss decreased with raising the frequency. While, the dielectric loss and dielectric loss tangent increased with increasing the temperature. Moreover, the activation energy of the MOS device was calculated as a function of frequency. Both the electrical and dielectric properties of the developed MOS were dependent on temperature and frequency.

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