

## Illumination effects on current-voltage and capacitance-voltage (C-V) characteristics of Au/Bi-doped PVA/n-Si (MPS) type schottky diodes (SDs)

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The electrical characteristics of Au/Bi-doped polyvinyl alcohol (PVA)/n-Si type SDs have been investigated using I-V and C-V measurements both in dark and under illumination at room temperature. Experimental results show the main electrical parameters such as ideality factor ( $n$ ), barrier height ( $\phi_b$ ), series and shunt resistances ( $R_s$  and  $R_{sh}$ ) and the density of interface states/traps ( $N_{ss}$ ) were found to be strong function of illumination level and applied bias voltage. In addition, two types of SDs with and without PVA interfacial polymer layer were fabricated to investigate the effects of the PVA (Bi-doped) interfacial layer on the main diode parameters. The  $R_s$  values were determined from the I-V characteristics by using both Ohm's law and Cheung's functions. The energy distribution profile of  $N_{ss}$  was also obtained from the forward bias I-V characteristics by taking into account voltage dependent barrier height and ideality factor. It can be concluded that the Bi-doped interfacial PVA layer lead to a considerably decreases in the leakage current,  $R_s$  and  $N_{ss}$  and increase of  $R_{sh}$  and rectifier rate ( $RR=I_F/I_R$ ). As a result, Bi-doped PVA considerably improved the diode performance.

### Biography

Sahar Alialy has completed her Master of Science at the age of 26 years from Azad University of Iran. Her Major is in Atomic Molecular Physics, She is Ph.D. student at Gazi University of Ankara, Turkey. She was the top 10 in Master level and top 3 in Graduate level Iran. She is the selected researcher in "Region 2 all Azad Universities in Iran". The writer and editor of Physics Magazine in Faculty of Physics, Azad University. She has been worked as secretary of Academic Research Association of Azad Universities for 5 years.

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