Genene Tessema Mola, J Nanomed Nanotechnol 2016, 7:3(Suppl)
http://dx.doi.org/10.4172/2157-7439.C1.034



# Effect of solvent additives in nano-scale morphology of thin film organic solar cell

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Polymer-fullerene based thin film organic solar cells (TFOSC) composed of poly(3-hexylthiophene (P3HT) donor and [6,6]-phenyl-C61-butyric acid methyl ester (PCBM) electron acceptor are investigated with and without different processing additives such as: 1,8-diiodooctane (DIO), 1-chloronaphthalene (CN) and dimethyl sulfoxide (DMSO). The effect of these solvents on device performance has been investigated and discussed in terms of changes in optical, electrical and microstructural properties of the photoactive films. Among the additives used in this study DIO has shown remarkable effect on preventing the formation of defect related clusters in the medium and assists the crystallization of the polymer chain leading to the best device performance in the investigation. The nanoscale structures of the films produced with DMSO showed the presence of large concentration of defect clusters resulting in poor performance. Various results of TFOSC devices with and without solvent additives are compared and thoroughly discussed.

## Biography

Genene Tessema Mola has completed his PhD in 2003 from University of Bonn, Germany. Following his Ph.D degree, he joined Addis Ababa University (AAU) as an Asistant Professor of Physics and currently serving as an Associate Professor of Physics at the University of KwaZulu-Natal. He served as director of Material Science Program at AAU. He has published more than 30 papers in reputed journals and has been serving as reviewer and an editorial board member of reputable journals.

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