24th Global
Organic & Inorganic Chemistry Conference
July 18-19, 2018 | Atlanta, USA

Development in organic field effect transistors based on organic-inorganic materials

Davoud Dastan and **Hamid Garmestani**
Georgia Institute of Technology, USA

Nanocomposite materials have been used to fabricate organic field-effect transistors (OFET's) using low-cost spin coating technique. The composite materials demonstrated outstanding properties such as high dielectric constant and high homogeneity. These devices are common in modern day development of organic electronics. Until recently, most research regarding OFET's has been focused on developing novel process techniques whereas enhancement in the mobility has remained stagnant. Gold contacts were thermally made on top of the substrates to fabricate top-contact bottom-gate devices. High dielectric constant (k) materials were employed to decrease the power consumption of the fabricated FET's. The current leakage was very low which indicates the reliability of these devices based on high-k materials. The electrical features such as output and transfer characteristics of the devices were measured using semiconductor parameter analyzer. The obtained results illustrated low operating voltage, high ON current and fast operation. Additionally, the simulation was performed to elucidate the growth mechanism of gate layer on the substrates and its contribution to the enhancement of the electrical properties of the fabricated devices.

Biography

Davoud Dastan is a research associate at Georgia Institute of Technology. Prior to his appointment at George Tech., he was a post-doc. fellow at Cornell University, Ithaca, New York, USA. He is working on nanomaterials for energy applications. He has published several papers and has been serving as an editorial board member of repute.

d.dastan61@yahoo.com

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