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MoS₂-reduced graphene oxide composites materials for optoelectronics device

Sarma S and Ray S C
University of South Africa, South Africa

Molybdenum di-sulphide (MoS₂) thin films were prepared by the dip-coating technique at different baking temperatures (400 °C – 450 °C) using methanol solution of ammonium molybdate and ammonium thiocyanate and subsequently coated with the conventionally prepared graphene oxide (GO) prepared by the Hummer's method. We have studied their different properties using UV-VIS spectroscopy, photoluminescence (PL), x-ray photoelectron spectroscopy (XPS) and ultraviolet photoemission spectroscopy (UPS). XPS and UPS measurement shows formation of different phases of MoS₂-GO thin films. The valence band maximums and their work function were obtained from the UPS spectra. It found that the MoS₂-GO behaves different from MoS₂ as well as GO. All measurements show the materials are composite of MoS₂-GO and very useful for the optoelectronics applications.

Recent Publications:

1. Sarma S, Ray S C and Strydom A M (2017) Electronic and magnetic properties of nitrogen functionalized grapheneoxide. *Diamond and Related Materials* 79:1–6.
2. Soin N, Ray S C, Sarma S, Mazumder D, Sharma S, Wang Yu-Fu, Pong W F, Roy S S and Strydom A M (2017) Tuning the electronic and magnetic properties of nitrogen-functionalized few-layered graphene nanoflakes. *The Journal of Physical Chemistry*. DOI 10.1021/acs.jpcc.7b01645.
3. Ray S C, Mukherjee D, Sarma S, Bhattacharya G, Mathur A, Roy S S and McLaughlin J A (2017) Functional diamond like carbon (DLC) coatings on polymer for improved gas barrier performance. *Diamond and Related Materials* 80:59–63.
4. Ghosh B, Ray S C, Mbule P, Sarma S, Mishra D K, Wang Y F, Pong W F and Strydom A M (2017) Defect induced room temperature ferromagnetism in single crystal, poly-crystal, and nanorod ZnO: A comparative study. *Journal of Applied Physics* doi: 10.1063/1.4986606
5. Sarma S, Mothudi B M and Dhlamini M S (2016) Observed coexistence of memristive, memcapacitive and meminductive characteristics in polyvinyl alcohol/cadmium sulphide nanocomposites. *Journal of Material Science: Materials in Electronics* 27:4551–4558.

Biography

Sarma S is involved in extensive research and application of 2D- materials (GO and MoS₂) and also nanomaterials (CdS, PbS and ZnO) under National Research Foundation, South Africa. She has contributed to the study and application of these materials into relevant fields of electronics viz., memristive systems and optoelectronic devices.

tsweets@unisa.ac.za