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Graphene based Piezoresistive strain sensor for human body motion detection

PGKA Perera¹, HPTS Perakotuwa², AAN Prabhath², DDNB Daya¹, Vimukthi Jayaweera³,

¹*Department of physics, University of Colombo, Colombo Sri Lanka*

²*Department of Materials Science and Engineering, University of Moratuwa, Sri Lanka*

³*Sri Lanka Institute of Nanotechnology (SLINTEC), Homagama Sri Lanka*

pereraachintha84@gmail.com, tharinduperakotuwa@gmail.com,
nisalaprabhath@gmail.com, vimukthiJ@slintec.lk, daya@phys.cmb.ac.lk

ABSTRACT

Graphene is a popular material among scientists because of its characteristics and different varieties of applications. Piezoresistivity is one of the main characteristic that graphene exhibits and in this work, a strain sensor has been fabricated using piezoresistivity of graphene. Though there are several methods to fabricate the sensor, graphene oxide (GO) was used as the initial material to fabricate it on a flexible transparent Polyvinyl chloride (PVC) substrate and then reduced graphene oxide (rGO) was produced using LASER-induced reduction method (after LASER treatment resistance was 6.3 ± 0.5 k Ω /cm). After the reduced graphene oxide (rGO) was obtained, several tests (tests to observe results of the LASER treatment and the sensor reactions with changing strain) were carried out to investigate the characteristics of the fabricated graphene based strain sensor. Gauge factor of the sensor was calculated (149 during tensile strain and as 231 during compressive strain) to gain the sensitivity of strain gauges. It has been found that fabricating method of this sensor was cost effective comparative to other methods. The intension of fabricating this sensor was to detect human body motion and the results had proven in achieving the objective.

Key words: Strain sensor, LASER-induced reduction of graphene oxide, Reduced Graphene oxide (rGO), Gauge factor (GF)

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