

Infra Red Laser Induced Ablation of Graphene Based Polymer Nanocomposites

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Abstract : IR laser-induced ablation of poly(butylacrylate-methylmethacrylate/hydroxyl ethyl methacrylate)/reduced graphene oxide (p(BA/MMA/HEMA)/rGO) was examined with 0.5, 0.75 and 1 wt% reduced graphene oxide content in relation to polymer. The irradiation was performed with TEA (transversely excited atmosphere) CO₂ laser using incident fluence of 15-20 J/cm², repetition frequency of 1 Hz, in an evacuated (10⁻³ Pa) Pyrex spherical vessel. Thin deposited nanocomposites films with large specific area were obtained using different substrates. The properties of the films deposited on these substrates were evaluated by TGA, FTIR, (Thermogravimetric analysis, Fourier Transformation Infrared) Raman spectroscopy and SEM microscopy. Homogeneous distribution of graphene sheets was observed from the SEM images, making polymer/rGO deposit an ideal candidate for SERS application. SERS measurements were performed using Rhodamine 6G as probe molecule on the substrate Ag/p(BA/MMA/HEMA)/rGO.

Keywords : laser ablation, reduced graphene oxide, polymer/rGO nanocomposites, thin deposited film

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