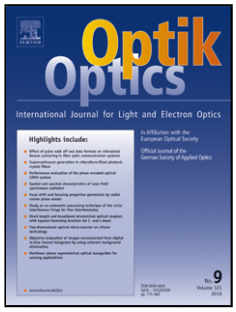

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Thin reduced graphene oxide film with enhanced optical nonlinearity

B. Heidari[1], A. Majdabadi[1,*], L. Najei[2], M. Sasani Ghamsari[1,*], Z. Fakharan[2], S. Salmani[3]

[1]Photonics & Quantum Technologies Research School, NSTRI, 11155-3486, Tehran, Iran
[2]Department of Chemistry, Amir Kabir University of Technology, 15875-4413, Tehran, Iran
[3]Photonic Laboratory, Department of Physics, Kharazmi University, 15719-14911, Tehran, Iran

Abstracts:

In this study, a simple route was employed to prepare reduced graphene oxide (rGO) thin films using drop casting technique. Different analytical methods such as XRD, SEM, FTIR, and Raman spectroscopy were used to evaluate the structural characteristics and optical properties of synthesized samples. Optical nonlinearity of as-prepared rGO layers were measured by z-scan technique under CW laser radiation at low intensity of light. Experimental results showed that rGO thin layers have nonlinear refractive indexes ($n_2 \approx 10^{-4}$ $cm^2.W^{-1}$) depend on the film thickness that has not been reported before. The obtained results of nonlinear optical measurements demonstrate that the optical nonlinearity of thin reduced graphene oxide film is affected by film thickness and its quality. The experimental results confirm that the change in absorption of thin rGO films is due to state filling effects and the optical nonlinearity is in fact proportional to the carrier density.

Keywords: reduced graphene oxide, thin film, optical nonlinearity

***Corresponding authors:**
A. Majdabadi: majd20@gmail.com,
M. Sasani Ghamsari: msghamsari@yahoo.com, msasani@aeoi.org.ir