Investigation of Structure, First Order Optical Susceptibility, Non-linear Optical, Electrical Susceptibility Results and IV Characterizations of Graphene Multilayer

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Graphene sample was synthesized using pulsed laser deposition technique. The structure for graphene sample was investigated using both of transmission electron microscopy, for powder graphene, diffraction electron microscopy, and X-ray diffraction technique for thin film. The first order of moment M_{-1} and the third order of moment M_{-3} were determined optically. The linear optical susceptibility $\chi^{(1)}$ for this sample was determined. Non-linear optical parameters such as third-order non-linear optical susceptibility $\chi^{(3)}$, non-linear absorption coefficient β_c, and non-linear refractive index n_2 were determined for this sample. The electrical susceptibility χ_e and relative permittivity ε_r were calculated. The electronic results such as density of valence band, density of conduction band, and Fermi level position were determined. IV characterizations for this sample were studied in case of forward and reverse current and in case of darkness and illumination.

Keywords: graphene multilayer, non-linear optical properties, semiconducting results, IV characterizations.

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