

Investigation of Laser Scribing Technique for Graphite Oxide Reduction and Patterning

M. Prasath, J.G.D.S.D. Jayasinghe, and D. Attygalle

Engineering a low cost graphene-based electronic device has proven difficult to accomplish via a single-step fabrication process. An infrared laser assisted technique to reduce graphite oxide (GO) to graphene, at ambient conditions, was studied in detail. The GO films for this study were fabricated using the modified Hummer's method. The raw materials used for this project was Sri Lankan vein graphite. The GO films were deposited on flexible polymer substrate. The laser scribing technique is shown to be successful in reducing GO, and also patterning of graphene. The FT-IR spectra before and after laser exposure have confirmed the reduction GO. In addition, by varying the laser intensity and laser irradiation time, the resistivity of the material can be precisely tuned over 5 orders of magnitude from $7.5 \times 10^6 \Omega\text{m}$ to $14.1 \Omega\text{m}$.