

Large-Scale Production of High-quality Graphene Through Reducing Graphene Oxide by Thermite Reaction

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Abstract

Large-scale production high-quality graphene flakes is desirable for printable electronics, catalysis, energy storage, and composites. While, mechanical exfoliation remains a large majority of graphite [1]. Electrochemical exfoliation [2] and Oxidation of graphite into monolayered graphene with large lateral dimensions provide a flexibility for the high-yield production of graphene. However, it has not been possible to remove the oxygen functional groups completely. Some reports [3,4] have proved that rapid heating of the graphene oxide (GO) at extreme high temperature (3000K-4000K) could cause desorption of oxygen functional groups and reorder the graphene basal plane. Thermite reaction is a severe exothermic reaction with a large heat release that can attain a temperature higher than 3000K [5]. Herein, we reported a simple and effective route to convert GO to high-quality graphene by thermite reaction. The D/G ratio of as-resulted graphene is as low as 0.5.

References

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Figures

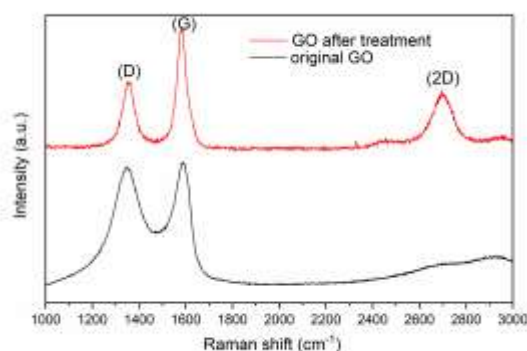


Figure 1: Raman spectra of original GO and GO after thermite treatment.