

HIGHLY OXIDIZED GRAPHENE OXIDE AND METHODS FOR PRODUCTION THEREOF

ABSTRACT

A highly oxidized form of graphene oxide and methods for production thereof are described in various embodiments of the present disclosure. In general, the methods include mixing a graphite source with a solution containing at least one oxidant and at least one protecting agent and then oxidizing the graphite source with the at least one oxidant in the presence of the at least one protecting agent to form the graphene oxide. Graphene oxide synthesized by the presently described methods is of a high structural quality that is more oxidized and maintains a higher proportion of aromatic rings and aromatic domains than does graphene oxide prepared in the absence of at least one protecting agent. Methods for reduction of graphene oxide into chemically converted graphene are also disclosed herein. The chemically converted graphene of the present disclosure is significantly more electrically conductive than is chemically converted graphene prepared from other sources of graphene oxide.

Fig. 1