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Effect of initial graphite particle size and shape on oxidation time in graphene oxide**prepared by Hummers' method**

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Abstract

The effect of initial graphite particle size and shape on oxidation time of graphite prepared by Hummers' method has been investigated. The oxidation was performed on three series of graphite particles, clod powder with two different sizes of 18 and 6 μm and flake shaped powder with average particle size of 25 μm . The samples were characterized by means of particle size analyzer, X-ray diffraction (XRD) and scanning electron microscopy (SEM). The ratio of XRD graphite oxide peak intensity to graphite peak intensity was considered as an indicator of the oxidation degree. It was observed that the oxidation time has a critical dependence on the initial graphite particle size and shape. While the oxidation of the clod samples was completed in several days, the oxidation of flake powder was completed just in 2 hours. These findings help researchers to save time by choosing the initial particle size and shape of initial graphite powders.

Keywords: Graphene oxide; Hummers method; Particle shape; Oxidation time; Particle size

1. Introduction

Graphene is one of the carbon's allotropes with just one atom thick in which the carbons are formed a honeycomb lattice of SP^2 hybridization bonds [1]. Super electrical and thermal conductivities, high mechanical strength, high specific surface area and interesting transport properties such as quantum Hall effect have made graphene the most widely considered material,

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