

# Accepted Manuscript

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PII: S0301-679X(17)30311-0

DOI: [10.1016/j.triboint.2017.06.023](https://doi.org/10.1016/j.triboint.2017.06.023)

Reference: JTRI 4783

To appear in: *Tribology International*

Received Date: 7 May 2017

Revised Date: 10 June 2017

Accepted Date: 15 June 2017

Please cite this article as: Zhao J, Li Y, Mao J, He Y, Luo J, Synthesis of thermally reduced graphite oxide in sulfuric acid and its application as an efficient lubrication additive, *Tribology International* (2017), doi: 10.1016/j.triboint.2017.06.023.

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# Synthesis of Thermally Reduced Graphite Oxide in Sulfuric Acid and Its Application as an Efficient Lubrication Additive

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## Abstract:

Graphene as an efficient lubrication additive attracts more and more attentions. The structure and the properties of graphene are influenced by its synthesis process. Although thermal reduction of graphene is an excellent method, such graphene always has some defects including obvious fold and wrinkling. In this study, a new synthesis method of thermally reduced graphite oxide in sulfuric acid (SA-tRGO) is proposed for preparing a graphene additive, and it shows a lamellar structure without obvious fold and wrinkling. The SA-tRGO shows outstanding tribological properties, and even at a high load (1.86 GPa) the friction coefficient and the wear rate still can be decreased by 30 % and 75 %, respectively. The synthesis method is simple and has great industrialization potential.

**Key words:** Thermal reduction, Sulfuric acid, Graphene additives, Friction and wear

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