

## Two Different Approaches to Control the Stage of Graphite-bisulfate Compounds

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For the producing graphene in industrial purpose, the exfoliation of graphite intercalation compounds(GICs) receives a lot of attention for the mass production method of graphene. The exfoliation efficiency of GICs is considered to be affected with their stage. For identifying the relation between exfoliation efficiency and stage of GIC, GICs with diverse stage are needed.

When sulfuric acid enters between graphite layers, strong oxidant,  $\text{KMnO}_4$ , is needed. There are two different approaches to control the stage of graphite-bisulfate compounds. One approach is decreasing the ratio of oxidant to graphite and supplying excess sulfuric acid. Another approach is increasing the ratio of oxidant to graphite and diluting the concentrated sulfuric acid. From these two different approaches, stage 1 to 5 graphite-bisulfate compounds were synthesized.