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# Lithium-storage Properties of Gallic Acid-Reduced Graphene Oxide and Silicon-Graphene Composites

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## Abstract

Graphene oxide (GO) was de-oxygenated using gallic acid under mild conditions to prepare reduced graphene oxide (RGO). The resultant RGO showed a lithium-ion storage capacity of 1280 mA h g<sup>-1</sup> at a current density of 200 mA g<sup>-1</sup> after 350 cycles when used as an anode for lithium ion batteries. The RGO was further used to stabilize silicon (Si) nanoparticles to prepare silicon-graphene composite electrode materials. Experimental results showed that a composite electrode prepared with a mass ratio of Si:GO = 1:2 exhibited the best lithium ion storage performance.

**Keywords:** reduced graphene oxide, silicon nanoparticles, anode, battery, lithium-ion

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