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## Ultrahigh capacity anode material for lithium ion battery based on rod gold nanoparticles decorated reduced graphene oxide

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### ABSTRACT

In this study, we report the synthesis of rod shaped gold nanoparticles/2-aminoethanethiol functionalized reduced graphene oxide composite (rdAuNPs/AETrGO) and its application as an anode material for lithium-ion batteries. The structure of the rdAuNPs/AETrGO composite was characterized by scanning electron microscopy, transmission electron microscopy, x-ray photoelectron spectroscopy and x-ray diffraction. The electrochemical performance was investigated at different current rates by using a coin-type cell. It was found that the rod shaped gold nanoparticles were highly dispersed on the reduced graphene oxide sheets. Moreover, the rdAuNPs/AETrGO composite showed a high specific gravimetric capacity of about 1320 mAh g<sup>-1</sup> and a long-term cycle stability.

Keywords: Reduced graphene oxide, metal nanoparticle, anode, Li ion battery

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