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Investigation of reduced graphene oxide as an alternative carbonaceous material for lithium ion batteries: A density functional theory study

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Producing electrical energy from fossil fuels proves to be a growing concern and requires alternatives for it to be sustainable. The electrical generation capacity is still not enough. Renewable energy (RE) generation faces an uncertain future as most of its generation processes require favorable conditions, the sun must shine or the wind blows. One way to ensure continuous supply of renewable energy is to have a storage device to store excess energy produced during those sunny and windy days. Available storage devices however suffer from low energy densities, very expensive and short lifespan. The full-scale development of lithium-ion batteries is largely limited by the energy density. A lot of research is carried out to address the low energy density in recent years but it is still low to meet the fast pace development of materials and machinery. The current study uses density functional theory for reduced graphene oxide (RGO) analyses to use in lithium ion batteries. Our results suggest that RGO possesses excellent properties for use in lithium ion batteries for improved energy storage.
Keywords: Renewable energy, reduced graphene oxide, Lithium-ion, energy storage

Apply to be considered for a student ; award (Yes / No)?

Yes

Level for award;(Hons, MSc, PhD, N/A)?

PhD

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