

Eco-friendly preparation of reduced graphene oxide- $\text{Li}_4\text{Ti}_5\text{O}_{12}$ (RGO-LTO) on filter paper for electrode material of lithium battery

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Lithium ion batteries are one of the efficient energy sources for hybrid electric vehicles as well as for portable electronic devices. Recently, $\text{Li}_4\text{Ti}_5\text{O}_{12}$ (LTO) has been studied for an anode material of lithium battery electrode due to no structural changes and stable potential plateau at 1.5V. However, the electrical conductivity of LTO is very low and it decreases the performance at higher C-rates. To improve the electrical conductivity of LTO particles, surface coatings by metal nanoparticles or carbonaceous materials such as graphene and CNT has been considered. Herein, we report the preparation and direct use of current collector, conductive additives and binder free RGO-LTO assembled filter paper as an anode material of lithium battery. The layer by layer assembly of graphene sheets increases the electrical conductivity and interface between the graphene-LTO improves the faster electrolyte diffusion. The electrochemical performance of RGO-LTO on the filter paper electrode exhibits the higher specific capacity and excellent rate capability at various C-rates.