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Graphene-embedded $LiMn_{0.8}Fe_{0.2}PO_4$ composites with promoted electrochemical performance for lithium ion batteries

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Abstract: Electron transfer and lithium ion diffusion rates are the key factors leading to sluggish electrochemical kinetics of $LiMn_{0.8}Fe_{0.2}PO_4$. In this work, we have successfully synthesized graphene-embedded $LiMn_{0.8}Fe_{0.2}PO_4$ composites via a facile graphene oxide assisted solvothermal route associated with carbonthermal treatment. The effect of graphene on the morphology, crystalline structure as well as electrochemical properties of $LiMn_{0.8}Fe_{0.2}PO_4$ is investigated. It can be found that the introducing graphene can reduce the particle size to form $LiMn_{0.8}Fe_{0.2}PO_4$ nanocrystals without destroying the crystalline structure of $LiMn_{0.8}Fe_{0.2}PO_4$. And the $LiMn_{0.8}Fe_{0.2}PO_4$ nanocrystals dispersed on the graphene sheets which were further cross-linked via the oxygen-containing groups of GO as cross-linking sites, resulting in that graphene sheets embedded in the $LiMn_{0.8}Fe_{0.2}PO_4$ composites. Benefiting from

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