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Pie-like free-standing paper of graphene paper@Fe_3O_4 nanorod array@carbon as integrated anode for robust lithium storage

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ABSTRACT

Repressing the hampers of poor electrical conductivity and pulverization is central for the applications of metal oxides anode materials, yet remains big challenge. To meet the target, pie-like graphene paper@Fe_3O_4 nanorod arrays@carbon film is designed and fabricated as high-performance integrated electrode for lithium ion batteries. Graphene paper is selected as binder-free integrated substrate, which could accelerate electron transfer, buffer volume changes of Fe_3O_4, contribute to additional capacity, and endow the electrode with flexibility. The carbon film serves as the package to prevent the dissolution of Fe_3O_4 into the electrolyte, extending the cyclic life of the integrated electrode. The architecture of Fe_3O_4 nanorod array offers void space for volume buffer and fluid electrolyte infiltration. Based on the combined structural advantages, the present pie-like electrode with interior array architecture therefore

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