

3D Black phosphorus/Graphene oxide composite synthesized by heat treatment for utilized of Lithium ion capacitor

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Black phosphorus is known as a 2D semiconductor material. The material is a female-chair structure, with different levels of energy in the phosphorus, which allows control of the response site. By utilizing these features, the surface redox reaction of black phosphorus was activated and applied to lithium ion capacitors. When black phosphorus is aging, cycle performance is poor due to large volumetric changes, solving these problems, causing surface redox reactions, and applying them to lithium-ion capacitors. Through the solvent heat treatment method, black phosphorus and graphene oxide structures were simply manufactured, and sample analysis was carried out using various analysis equipment. As a result, the formation of P-O-C bonds was confirmed, and the capacity and life characteristics were increased. Through this experiment, we will be able to expect to improve electrochemical performance by utilizing the site control capability of black phosphorus.