

Enhancement in the reversibility of the zinc metal anode by conducting the black phosphorous coating layer

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Rechargeable zinc metal batteries (RZMB) has become fascinating research area due to the growing of energy storage market. Zinc ion battery has advantage in safety and cost-effectiveness with the stability of zinc ion in aqueous electrolyte. Metallic zinc has been considered as a anode material in spite of that it has several issues such as corrosion in mild acidic environment, battery failure by the short-circuit end caused by evenly distributed deposition of zinc ion. To address these, many attempts have been tried and coating method seems to be notable. Herein in this work, we synthesized black phosphorous coated zinc metal anode and analyzed this coating layer with top view and cross sectional SEM, XRD, and XPS depth profiling. Then, enhanced performance was confirmed with electrochemical analysis and the effect of black phosphorous coating layer was figured out with in-situ optical microscopy evaluation.