

Aqueous Zinc ion Batteries with Electrodeposition derived Zinc hosted MXene Anode

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As the importance of alternative of Lithium-ion batteries has been highlighted, Zinc-ion batteries(ZIBs) have become one of the next generation energy storage device due to facile, safe, eco-friendly, and cost-effective properties of their aqueous system. However, ZIBs still have limitation that stability issue of dendrite formation on Zn metal and side reactions (byproduct & HER). Introduction of Zn hosting materials is one strategy for improving stability of ZIBs anode by resolving above mentioned problem. In this research, an electrochemically deposited MXene@Zn was designed as ZIBs anode to achieve high electric/ionic conductivity and dendrite-free Zn stripping/deposition. Directly pasted MXene onto the carbon cloth current collector can be used to facile electrochemical deposition. The electrodeposited MXene@Zn anode shows more stable and faster Zn stripping/deposition than bare Zn and electrodeposited carbon cloth@Zn. Furthermore, not only Zn/MnO₂ full cell with a-MnO₂ cathode, but also the patterned electrode device was successfully adapted. This work provides one favorable way to develop the stable and practical next generation energy storage device.