Controlled Zn electrodeposition/dissolution by interfacial engineering for aqueous Zn-based batteries

김희탁†
KAIST
(heetak.kim@kaist.ac.kr†)

Aqueous zinc-based flow batteries are an attractive option for energy storages system due to their inflammability and high energy density. However, non-uniform Zn deposition and dissolution, which is represented by Zn dendrite formation, causes internal short circuit, capacity drop, and low coulombic efficiency, limiting long-term operation of Zn-based batteries. Uncontrolled Zn nucleation/growth or limited Zn-ion transport leads to inhomogeneous Zn reaction and triggers dendritic Zn growth. In this aspect, advanced engineering of the Zn/substrate and Zn/electrolyte interface, which can control these processes, is strongly demanded. In this talk, we present that an atomistic-designed carbon current collector and a structured interlayer on Zn electrode can control these interfacial processes for inducing dendrite-free Zn deposition.