

## New electrode concepts in Aqueous Zinc Ion Batteries

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Although Li-ion batteries have been successful in various applications, their shortcomings with regard to high cost and global maldistribution of raw materials, as well as safety concerns have promoted alternative rechargeable batteries based on other carrier ions represented by sodium and magnesium ions, targeting grid-scale energy storage systems (ESSs). However, many electrode materials in these emerging systems often suffer from sluggish kinetics due to the larger size or bivalency of carrier ions, limiting electrochemical performance particular in specific capacity and operation voltage. In this talk, I will introduce a new approach of engaging intercalated water in layered cathode materials. The intercalated water improves the performance of the given materials substantially by shielding electrostatic interactions or maintaining the crystal frameworks over repeated cycles. Detailed effects of intercalated water will also be described, along with promising potentials towards aqueous operations. I will also briefly introduce recent studies on zinc metal electrodes.