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| Abstract |  |
| The development of new battery technologies requires them to be well-established given the competition from lithium ion batteries (LIBs), a well-commercialized technology, and the merits should surpass other available technologies’ characteristics for battery applications. Aqueous rechargeable zinc ion batteries (ARZIBs) represent a budding technology that can challenge LIBs with respect to electrochemical features because of the safety, low cost, high energy density, long cycle life, high-volume density, and stable water-compatible features of the metal zinc anode. Research on ARZIBs utilizing mild acidic electrolytes is focused on developing cathode materials with complete utilization of their electro-active materials. This progress is, however, hindered by persistent issues and consequences of divergent electrochemical mechanisms, unwanted side reactions, and unresolved proton insertion phenomena, thereby challenging ARZIB commercialization for large-scale energy storage applications. Herein, we broadly review two important cathodes, manganese and vanadium oxides, that are witnessing rapid progress toward developing state-of-the-art ARZIB cathodes. | |