

Development of High-performance Aqueous Dual-Ion Batteries

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Dual ion battery (DIB) has been considered as an extended energy storage system from Li-ion battery (LIB). Attributing to the intercalation of anion and cation into graphitic carbon, the cycle stability and rate property can be significantly increased. However, as same as traditional LIBs the safety issue caused by the flammable organic electrolyte has restricted the further development. On the purpose of circumventing the safety dilemma, aqueous electrolyte can be a safe alternative due to its intrinsically nonflammable advantage. On the other hand, development of adequate electrode materials with higher energy densities are also strongly required for an aqueous dual-ion battery. In this study, a novel aqueous bisalt electrolyte with high concentration was studied and introduced into the dual-ion battery system. Besides, the structure and composition change of the electrode and electrolyte during cycling process were investigated in detail.

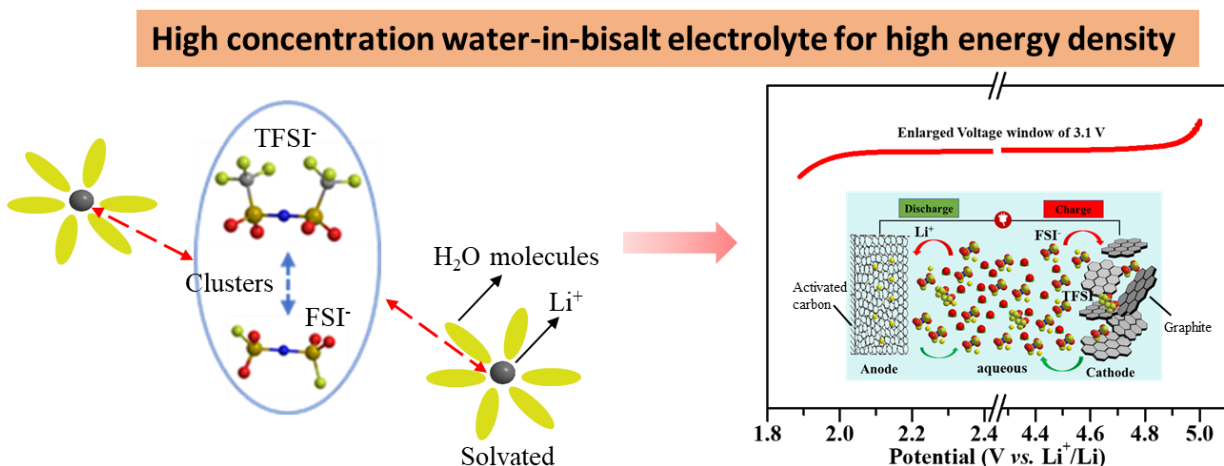


Fig.1 Schematic of a dual-ion battery using a high concentration bisalt electrolyte