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In Situ Synthesis of Hierarchical Poly(ionic liquid)-Based Solid Electrolytes for High-Safety Lithium-ion and Sodium-ion Batteries

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Abstract

The rapid development of lithium (Li)-ion and sodium (Na)-ion batteries requires advanced solid electrolytes that possess both favorable electrochemical performance and safety assurance. Herein we report a hierarchical poly (ionic liquid)-based solid electrolyte (HPILSE) for high-safety Li-ion and Na-ion batteries. This hybrid solid electrolyte is fabricated via in situ polymerizing 1,4-bis[3-(2-acryloyloxyethyl)imidazolium-1-yl]butane bis[bis(trifluoromethanesulfonyl)imide] (C1-4TFSI) monomer in 1-ethyl-3-methylimidazolium bis(trifluoromethanesulfonyl)imide (EMITFSI)-based electrolyte which is filled in poly(diallyldimethylammonium) bis(trifluoromethanesulfonyl)imide (PDDATFSI) porous

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