

A High-durability crosslinked polymer binder improves energy device stability and performance

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In this study, the designed breakthrough complex process (cross-linking and composite technique) excellently builds up the physical properties of polymer in easy one step. High-durable polymer binders were fabricated using free radical polymerization, nucleophilic substitution reactions. In addition, cross-linkable propyl-triethoxysilane moiety was covalently incorporated into the polymer matrix to improve the properties of the backbone poly(4-vinyl-pyridine), poly(vinyl imidazole). This polymer binder successfully synthesized by quaternization have been identified as FT-IR and ¹H-NMR. Also, it has been confirmed that mechanical, thermal properties of the polymer have enhanced. Hybrid polymer for electrode binder of redox capacitors display more excellent capacitance value with improvement of cyclic stability. This paper reveals cross-linked networks in the hybrid polymer are long cycle-life features for electrochemical pseudocapacitors.