

Improved high-temperature performance of lithium-ion batteries through use of a thermally stable co-polyimide-based cathode binder

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The effects of a thermally stable co-polyimide-based polymeric binder on the performance of a cathode electrode are investigated. The introduction of co-polyimide (P84) into a conventional polymeric binder system based on polyvinylidene fluoride (PVdF) enhances the cycle performance under high temperature conditions (60 °C). Because of the inherent mechanical and thermal stabilities of the co-polyimide, P84 retains outstanding adhesive/cohesive strength within the electrode composite, as well as between the electrode composite and the aluminium current collector. These findings are further supported by electrochemical impedance spectroscopic analysis, scanning electron microscope, and studies using a Surface and Interfacial Cutting Analysis System (SAICAS).