Short Communication

Temperature-dependent Degradation of the Copper Current Collectors in Lithium Ion Batteries Electrolyte

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Copper is usually used as a current collector in lithium ion batteries. Its stability is highly important in the performance of cell. In this paper, temperature dependent degradation of copper current collector was investigated at -20°C, 25°C and 50°C by electrochemical measurements. Scanning electron microscopy (SEM), X-ray diffraction (XRD) and energy dispersive spectroscopy (EDS) were used to analyze the microstructures of corroded copper. At -20°C and 25°C, obvious pitting corrosion occurs on the copper due to the self-catalyst of residual water. However, at 50°C, a loose layer containing a certain amount of LiF forms on the surface of the copper and no pitting hole is observed due to the exhaustion of the aggressive fluoride ions and the residual water.

Keywords: Lithium ion batteries; Copper current collector; Electrolyte; Temperature; Corrosion

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