Short Communication

Cycling Stability of Li-ion Batteries at Elevated Temperature

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Cycling stability of commercial Li-ion batteries (LIBs) at elevated temperature is investigated in the present study. Galvanostatic discharge/charge cycling demonstrates that LIB shows a much faster capacity fading at 60 °C with a low capacity retention rate of 47% after 100 cycles, in contrast to the value of 97% at 25 °C. Electrochemical impedance spectroscopy indicates that the internal resistance shows a much faster increase at 60 °C than at 25 °C. Further scanning electron microscopy observation suggests that the increase of resistance is mainly originated from the thickening of the solid electrolyte interface on the anode surface. These results indicate that temperature has a significant effect on the performance of LIBs, and operation of LIBs at elevated temperature should be prevented.

Keywords: Li-ion batteries; cycling stability; temperature; impedance; scanning electron microscopy

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