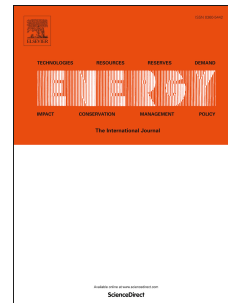


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Elevated temperature for life extension of lithium ion power cells

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Abstract

Lithium ion (Li-ion) cells are increasingly being used in high power applications such as Hybrid Electric Vehicles. This paper investigates how the life of lithium ion power cells can be increased by increasing their temperature. End of life (EOL) in power applications is often defined as when the battery is no longer able to provide the required charge/discharge power because the battery voltage exceeds the maximum/minimum allowable voltages associated with the battery's chemistry. This paper shows that battery life can be increased by step-wise temperature increases whenever the battery voltage exceeds a voltage limit when the EOL is reached. Experiments are conducted on commercially available lithium iron phosphate batteries for six months using a charge sustaining HEV cycle. Two, 1° C temperature increases extend the life of the cells by 2000 cycles (3 months of continuous cycling).

Keywords: Lithium ion battery, Battery management system, Hybrid electric vehicle, Battery aging model

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