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Abstract

The development of higher energy density lithium-ion cell designs

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Abstract

Progress in the development of higher energy density lithium-ion cell designs for a range of consumer and military applications will be described. Strategies for improvements in energy density based on the introduction of higher capacity electrode materials such as the $\text{LiNi}_{1-x-y}\text{Co}_x\text{Al}_y\text{O}_2$ cathode material with a high reversible capacity of 184 mAh g^{-1} will be presented. Electrochemical data will be used to illustrate the benefits of optimisation of electrolyte system to maximise lithium-ion cell capacity.

The performance characteristics of 'flat' cell designs utilising flexible laminate packaging materials will be presented in order to demonstrate that projected lithium-ion energy densities of 180 Wh kg^{-1} are achievable. Finally, comparisons between alternative lithium-ion and lithium-ion polymer cell designs will be discussed. © 2001 Published by Elsevier Science B.V.

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