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MODELLING OF CHARGE/DISCHARGE CYCLE OF LITHIUM ION BATTERY SYSTEM

(Pemodelan Kitaran Cas/Discas Sistem Bateri Litium Ion)

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ABSTRACT

In this paper, a general model of lithium ion battery based on specific charge/discharge profile of the battery has been developed. The governing equations are solved by explicit numerical method. The partial differential numerical simulation is performed using MATLAB software. The charge/discharge model is capable of predicting the total discharge time of a battery under various discharge rates. The simulated result is also compared to experimental data of specific condition from a specified journal. Then an equation that represents the simulation result is formulated.

Keywords: battery; lithium ion; modelling; charge/discharge; simulation

ABSTRAK

Dalam makalah ini, suatu model bateri ion litium berdasarkan profil cas/discas tertentu untuk bateri telah dibangunkan. Persamaan menakluk diselesaikan dengan menggunakan kaedah berangka tak tersirat. Simulasi berangka pembezaan separa dilakukan menggunakan perisian MATLAB. Model cas/discas ini mampu untuk meramalkan jumlah masa dicas bateri di bawah pelbagai kadar discas. Keputusan simulasi telah dibandingkan dengan data yang diperoleh daripada eksperimen untuk keadaan khusus daripada jurnal tertentu. Kemudian suatu rumus yang mewakili hasil simulasi diterbitkan.

Kata kunci: bateri; ion litium; pemodelan; cas /discas; simulasi

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