

## Electrochemical Cell Model and Adaptive Parameter Estimation Method for Lithium-ion Polymer Battery Modeling

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Lithium-ion polymer battery (LiPB) is one of the key components for fuel cell hybrid electric vehicle. In order to develop these batteries more efficiently, accurate modeling of battery's behavior is necessary. An electrochemical battery model for LiPB is suggested. The electrochemical cell model is suggested with equivalent-circuit-based dynamic model. Electrochemical impedance spectroscopy (EIS) measurements are used to estimate the state of charge, SOH and initial parameters of battery cell model. Modeling of self discharge, hysteresis and relaxation of open circuit voltage and memory effect is suggested for accurate battery behavior estimation. Also, model parameters are estimated by adaptive method using kalman filter. This model is validated by experimental data with standard temperature environment. Accuracy of modeling is evaluated by using experimental results of LiPB battery module. The result is that proposed model is accurate to estimate battery behavior.