System modeling and state estimation method for Lithium ion battery system of Energy storage system

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In Recently, the energy storage system(ESS) is of growing importance in respect of safety and efficiency of power supply. The accuracy of state estimation for Lithium ion battery system is enable to operate on ESS for economic feasibility and safety. This research is about development of the State of health(SOH) estimation algorithm for lithium ion secondary battery which is applicable on ESS system. Many existing methods have weak points such as necessity of experimental cyclic degeneration data and high computational load for complexity of modeling. The proposed method is developed with using the equivalent circuit model and parameters of the battery model is extracted from experimental data. Through introducing OCV0(Open circuit voltage) as optimization parameters, initial SOC0(State of charge) can be predicted accurately, and we can get a good SOH estimation performance. The average SOH error rate is below 3% and the maximum error rate is achieved below 5%. This estimation model is validated by test data at 0, 25, 50℃