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Research of SOC Estimation Algorithm for LiFePO₄ Battery based on Differential Curves

XU Shouping
(Position, Department, Organization)
City, Country

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Abstract

The State of Charge (SOC) of battery is an important parameter for battery capacity state, the accurate and real-time prediction is one of the most essential performances of for Battery Management System (BMS). Firstly, according to the open circuit voltage (OCV) characteristic of LiFePO₄ battery, the identification zone for SOC is determined. Under different aging conditions, ambient temperature and charge /discharge ratio, the differential curve of voltage versus capacity (dV/dQ vs. Q) against the charging progress was analyzed. Based on analysis results, the correction algorithm of SOC is proposed using the differential curve. Finally, the lithium battery energy storage system is built, the accuracy and applicability of the algorithm is verified by the experimental results .