

Development of Dynamic LiFePO₄ Battery Charging Systems for Dual Power Driving Vehicles

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ABSTRACT

In recent years, the increase of traditional internal combustion engine (ICE) vehicles cause the environmental pollution become more and more serious and the petroleum storage quantity are getting fewer and fewer on Earth. The techniques of energy-conservation and reduce carbons become most important research subject in the world. In order to improve these questions, the development of electric vehicles and hybrid electric vehicles is necessary. The generator control and battery management techniques are played important roles in electric vehicles or hybrid electric vehicles (HEV). In this thesis, we research the generator control and battery management techniques of dual power driving vehicle. Base on high efficiency power demand, we chose LiFePO₄ battery in the research. The performance of LiFePO₄ battery has high discharge power, fast charging and long cycle life. It is the present industrial field thought that conforms to the environmental protection, the security and the high performance. In this thesis, we develop the LiFePO₄ battery dynamic charging system for dual power driving vehicle. Considered the charging source of EV will unceasingly change with traveling condition. The dynamic charging system can immediately regulate optimum charge for LiFePO₄ battery according to energy of power source. The system has three most advantages that are high charging efficiency, maintenance battery security and electric quantity balanced charge. In order to verify the accuracy of this thesis, we constructed a platform of dual power driving vehicle. Through the experiment results, we prove the practicability of the dynamic charging system.

Keywords : Internal combustion engine (ICE), Hybrid electric vehicle (HEV), Lithium iron phosphate (LiFePO₄), Dynamic charging system, Generator

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