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## Temperature effect and battery charging characteristics analysis based on charging C-rate (Article) [\(Open Access\)](#)

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### Abstract

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Developing fast charging proprieties for LiFePo4 battery is a key issue for a wider deployment of EV. The main drawback of LiFePo4 battery charging is overcharge, overcurrent and high temperature which affects longevity, efficiency, and battery life cycle. In this research, lithium iron phosphate (LiFePo4) battery is investigated for fast, and rapid charging with CC-CV principle. MATLAB/Simulink based custom-designed tool was developed. A dynamic model of lithium-ion phosphate battery is proposed in this research by considering the significant temperature and capacity fading effects. Results have shown that the LiFePo4 battery can be used for fast charging up to 100% and rapid charging up to 85% by maintaining the condition for lifespan of the battery and to shorten the charging time. The simulation results have been showed that, the constructed model can really represent the dynamic performance feature of the lithium-ion battery. The modified model can assess the efficiency of battery execution based on charging C-rate conditions. © BEIESP.

### SciVal Topic Prominence ⓘ

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