Li-ion Battery Simulation for Charging and Discharging using MATLAB Simulink

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Abstract: *In EV and HEV applications, battery optimization has increased. Lithium-ion batteries, in particular, are increasingly used as an energy storage system in green technology applications because of their high power and energy density. Drawbacks are seen in electric car applications during the storage system's charging interval period. Multi-state charging is seen to be the best option in these circumstances. The state charging of lithium-ion batteries and their criteria for charging and discharging for long battery life are discussed in this study using the MATLAB Simulink tool. The state-of-charge (SOC), which is measured and used to assess charging and discharging characteristics, is a crucial factor in determining a battery's performance. Therefore, accurate SOC estimate is required to safeguard the battery and avoid overcharging and undercharging it. Additionally, by doing this, the battery's lifespan will be extended. Multi-state charging is used for applications that demand greater efficiency.*

Keywords: MATLAB, Li-ion, state-of-charge, electric car

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