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Towards high durable lithium ion batteries with waterborne LiFePO₄ electrodes

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Highlights

- Importance of mixing intensity for aqueous LiFePO₄ cathode slurries is demonstrated.
- Fe³⁺ rich layer formation on intensively mixed LiFePO₄ electrode surface is detected.
- C/LiFePO₄ pouch cells with aqueous processed electrodes show outstanding cyclability.
- Aqueous cathode slurry processing is viable approach toward cheaper and greener LIBs.

The positive electrodes based on nano- and micrometric carbon coated LiFePO₄ (LFP) powders are prepared via aqueous slurry processing using “normal” and “intensive” mixing procedures. The XRD, XPS, and electrochemical characterization reveals that the “intensive” mixing process improves the discharge C-rate capability of the n-LFP cathode however provokes formation of an undesirable thin surface layer enriched by Fe³⁺ species.

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