Aliovalent substitution in $LiFePO_4$ modifies its phase diagram, thereby enhancing its reactivity in a Li battery

Scientific Achievement

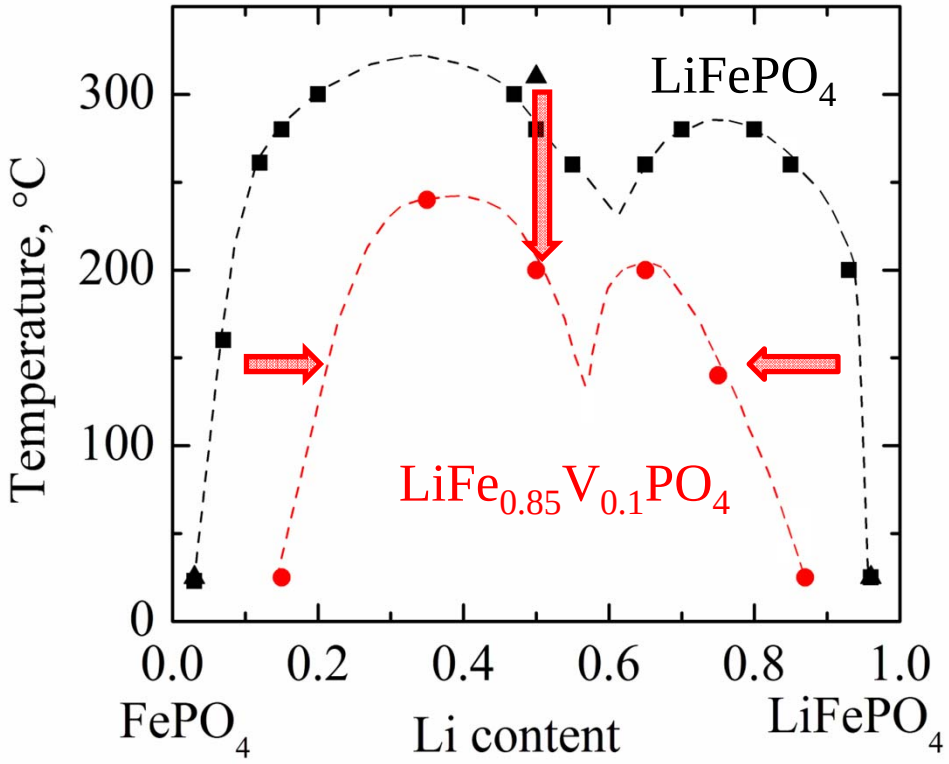
We have shown that aliovalent substitution at the Fe site broadens the single-phase region of the $LiFePO_4$-$FePO_4$ phase diagram. This explains the enhanced kinetics of substituted $LiFePO_4$, and is consistent with the NECCES pseudo-single-phase reaction mechanism.

Significance and Impact

Understanding $LiFePO_4$/$FePO_4$ transformation and why substitution accelerates it will help in designing the next generation battery materials.

Research Details

The structure and phase composition of vanadium-substituted $LiFePO_4$ was investigated as a function of Li and V contents, as well as temperature using in-situ synchrotron techniques at NSLS.



Phase diagram reveals broader solid solution range in vanadium-substituted $LiFePO_4$

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