

***In-situ* XAFS study of $\text{Li}_2\text{TiO}_3\text{-LiFeO}_2$ solid solution as a positive electrode material for lithium ion secondary batteries**

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Abstract

$\text{Li}_2\text{TiO}_3\text{-LiFeO}_2$ solid solution with rock salt structure has a interesting electrochemical behavior; lithium ions could be reversibly extracted and inserted at operating voltage from 4 V to 1.5 V vs. Li/Li^+ with capacity about 200 mAhg^{-1} . The charge and discharge mechanism was studied with *in-situ* Ti K- and Fe K- XANES measurements. The spectral changes indicated that the redox reactions of $3+/4+$ and $2+/3+$ in partial Fe ions concerned with 4 V and 2V capacities, respectively, while Ti remained $4+$ in valence through charge and discharge. The change in the local structure around Ti was suggested by Ti K-EXAFS analysis.

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