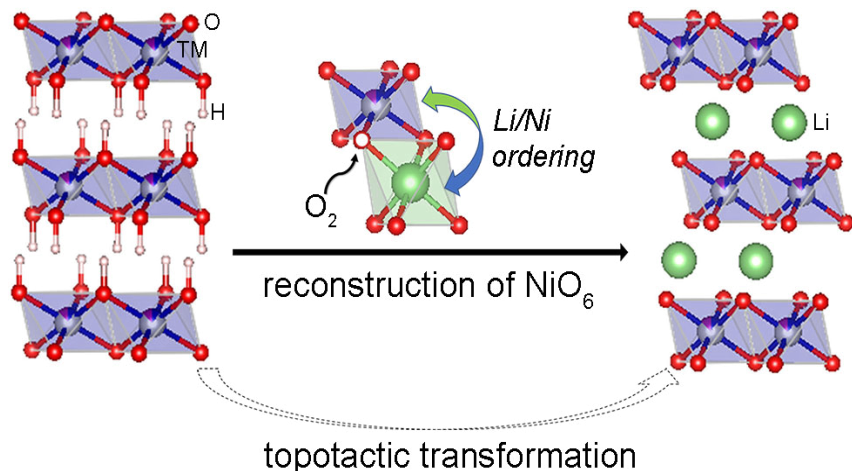


New Insights into the Synthesis Process of Layered Oxides



By using a combination of *in situ* x-ray characterization techniques at NSLS-II beamlines SRX and XPD, scientists investigated the structural evolution of a transition metal layered oxide during its synthesis. Their new insights helped them to understand how the layers arrange on larger and smaller scales.

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Work was performed in part at Brookhaven National Laboratory

Scientific Achievement

Scientists discovered that in the synthesis process of layered transition metal oxides symmetry breaking and reconstruction of the basic building units (BBUs) dominate the reaction pathway, and consequently affect the performance of these materials as battery cathodes.

Significance and Impact

Their findings on how these materials grow, may provide general principles for design and synthesis of high performance cathodes for commercial Li-ion batteries.

Research Details

- Using *in situ* multimodal techniques, including x-ray diffraction, pair distribution function analysis, and x-ray absorption near-edge spectroscopy, scientists studied the long- and short-range chemical and structural evolution and behavior of the individual basic building units (BBUs), during synthesis of high-Ni layered oxides.