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Phase segregation in Na_xCoO_2 for large Na contents

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Abstract

We have investigated a set of sodium cobaltates (Na_xCoO_2) samples with various sodium content ($0.67 \leq x \leq 0.75$) using Nuclear Quadrupole Resonance (NQR). The four different stable phases and an intermediate one have been recognized. The NQR spectra of ^{59}Co allowed us to clearly differentiate the pure phase samples which could be easily distinguished from multi-phase samples. Moreover, we have found that keeping samples at room temperature in contact with humid air leads to destruction of the phase purity and loss of sodium content. The high sodium content sample evolves progressively into a mixture of the detected stable phases until it reaches the $x = 2/3$ composition which appears to be the most stable phase in this part of phase diagram. © 2010 Pleiades Publishing, Ltd.

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