

Synthesis and ionic conductivity of NASICON - structured $\text{LiTi}_{2-x}\text{Sn}_x(\text{PO}_4)_3$ anode material for lithium - ion batteries

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Description

Advanced Li-ion batteries with high rate properties are highly in demand and have generated much attention in the research community. Here, we present a simple solid-state reaction to synthesise NASICON-structured $\text{LiTi}_{2-x}\text{Sn}_x(\text{PO}_4)_3$ ($x = 0-1.8$) as anode material for lithium ion batteries. Their structures were determined from X-ray powder diffraction using Rietveld analysis. All the compositions present the space group R-3c. The refinements show that Ti and Sn cations are statistically distributed over the same position while the Li ones are exclusively located on the M1 site. The lattice constants a and c exhibit linear variation over the whole composition range. The bond lengths are in accordance with those of other NASICON structures. The SEM micrographs of the samples show relative porous microstructures. The ionic conductivity is about $10^{-4}-10^{-5}$ ($\text{S} \cdot \text{cm}^{-1}$); for the activation energy, a typical value ...