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Structural Integrity and Microstructure of NA^+ Conducting Ceramics[1] KRISTINA LIPINSKA, Harry Reid Center for Environmental Studies and Dept. of Chemistry, University of Nevada Las Vegas, NV, PATRICIA KALITA, Dept. of Physics and Astronomy, University of Nevada Las Vegas, NV, USA, OLIVER HEMMERS, Harry Reid Center for Environmental Studies, University of Nevada Las Vegas, NV, USA, STANISLAV SINOGEIKIN, OLGA SHEBANOVA, WENGE YANG, Geophysical Laboratory, Carnegie Institution of Washington, Washington, DC, USA, GINO MARIOTTO, Faculty of Mathematical, Physical & Natural Science, University of Verona, Italy — Oxides with the general formula of $Na_{1+x}Zr_2Si_x$ $P_{3-x}O_{12}$, known as Nasicon, are fast Na+ ion-conducting materials with important electrochemical applications and many functional properties, often attributed to their unique structural features. Comparative, in situ studies of the limits of structural integrity were performed for selected Nasicon materials, using synchrotron x-ray diffraction and diamond anvil cell technology. We show how different processing conditions produce crystalline structures with specific morphology. We discuss the bulk modulus, the compressibility and the influence of the volume fraction of primary and secondary crystalline phases on the overall Nasicon structural integrity.

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