**Ionic and Thermal Transport Properties of ion conducting Ceramic Electrolytes**

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Within the current state of development, liquid electrolytes are utilized in Li-ion and post-Li batteries for electrochemical energy storage. These organic liquids serving as the solvents for Li or Na salts are not thermally stable and tend to degrade at higher temperatures. Most of these liquids are flammable which can be an important security issue in high power battery systems. With regard to security and stability, ceramic solid electrolytes offer a number of advantageous properties. Even at higher temperatures they are very stable and do not degrade, and therefore reduce the efforts of a sophisticated thermal management in All-Solid-State battery systems. Although there are numerous studies on the ionic transport in Li or Na conducting solid electrolytes, the thermophysical properties have been studied only in a small number of publications. Particularly, the thermophysical properties of glass-ceramic phosphates have not been investigated up to now. However, these properties might give additional insights in the physics of superionic conductors. Within this work we have studied NASICON (Na Superionic Conductor) structured ceramic systems, which are candidate materials for solid state electrolytes for Li-and Na-ion cells, respectively. Namely, LAGP (Li1+xAlxGe2-x (PO4)3, x=0.5) and LATP (Li1+x AlxTi2-x (PO4)3, x=0.5) substrates were prepared using a melt quenching route, while NaZSiP (Na3Zr2Si2PO12) and NATP (Na1+xAlxTi2-x(PO4)3) were synthesized by a precipitation method. The resulting powders were consolidated by applying different compaction methods. In order to develop a better understanding of the relationship between the specific microstructure and the ionic conductivity as well as the thermodynamic properties the samples were characterized by applying thermophysical measurement techniques. The ionic conductivity was measured using impedance spectroscopy while the thermal diffusivity and the specific heat were determined by Laser Flash technique and differential scanning calorimetry, respectively. The glass-ceramic systems were compared regarding their ionic and thermal transport properties.