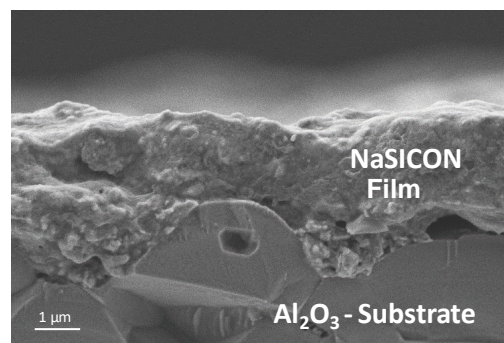
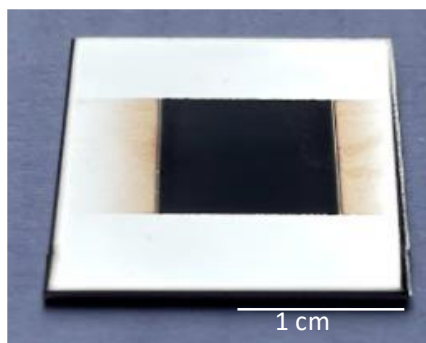


Sodium superionic conductors (NaSICON) for solid-state sodium batteries

Solid-state batteries are promising energy storage devices that can be widely used in near future in mobile devices, electric vehicles (EVs), and stationary energy storage solutions. A solid-state battery consist of a negative electrode, a solid electrolyte (SE) and a positive electrode. Commercial batteries contain liquid electrolytes, which need to be replaced with nonflammable solid electrolytes to provide safety. NaSICON SE have gained much attention in recent five years for their remarkable electric and chemical properties. One of the most attractive candidates for sodium-ion conductive SE is NaSICON regarding to its low cost and the high availability of the educts. Compared to industry dominant Li-ion counterparts, Na-ion batteries are lower in cost to create cheaper batteries.

The powder aerosol deposition (PAD) method enables to deposit dense films in the μm -range at room temperature on a wide variety of substrate materials. The coating usually is $> 95\%$ dense and no further sintering step is required. Therefore, NaSICON SE powder can be deposited on cathode materials to build half-battery cells by utilizing this method.

The aim of the work concerns the synthesis of NaSICON SE powder, film fabrication via PAD and investigating electrical and electrochemical film properties of half-cells. The work includes powder preparation processes (milling, sieving), material characterization methods (SEM, XRD), and electrical characterization methods (EIS).



The scope can be adapted to bachelor and master theses.

Responsible

Mutlucan Sozak, M.Sc.

Contact

Mutlucan.sozak@uni-bayreuth.de

+49 921 55 7173

www.funktionsmaterialien.de

www.funktionsmaterialien.de