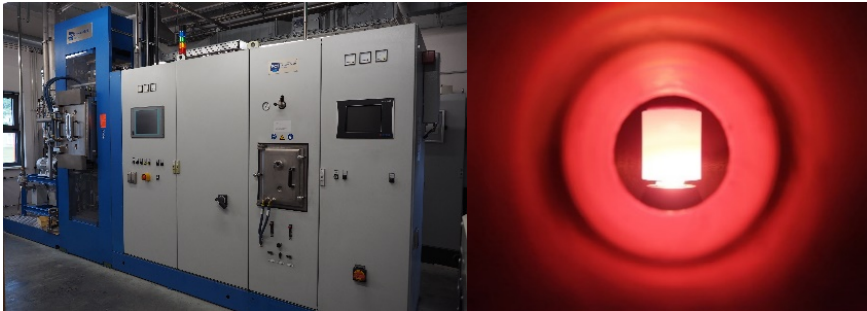


Master Thesis in the research field of All-Solid-State-Batteries

Fabrication of Solid-State-Electrolytes for All-Solid-State-Batteries via Spark Plasma Sintering



Figures: SPS machine (left) and sintering chamber in operation (below)

The electrification of our society is progressing steadily and is becoming more and more decentralized, which is why the demand for modern batteries and battery technologies is increasing. The solid-state batteries is one of the key technologies in which both the electrodes and the electrolyte consist of solid material. However, the realization of such batteries is challenging and put high demands on manufacturing technologies. Spark Plasma Sintering (SPS) is a modern process for densification of metallic alloys, composite materials and ceramic solids from powders, which could also be used for the fabrication of solid state batteries. Compared to conventional sintering processes, the materials produced in this way are usually characterized by better mechanical and physical properties. In particular, the formation of desirable solid-solid interfaces between material particles via SPS are very homogeneous, which makes material combinations generated in this way suitable for use in solid-state batteries. The aim of this work is to adapt the process for sintering the powder as a Solid-State Electrolyte (SSE) with high ionic conductivity. The manufactured SSE will then be characterized.

Qualification: Studies in Mechanical Engineering, Physics, Chemistry or comparable.

Supervisors: Prof. Dr.-Ing. Hermann Seitz

Dr. Abdullah Riaz/M.Sc. Christian Polley
Justus-von-Liebig-Weg 6
Tel: 0381/498-9138/ 9113
abdullah.riaz@uni-rostock.de
christian.polley@uni-rostock.de