



PhD position: ALD4SID

“Solid-state electrolyte thin films fabricated by atomic layer deposition for solid ionic devices”

Starting Date: As soon as possible

The project ALD4SID is a cooperation between KIT and Shanghai Jiao Tong University. The aim of this project is the fabrication and investigation of solid ionic devices (SID). These devices include thin films of all-solid-state lithium-ion batteries and also ionic field-effect devices. They are prepared by atomic-layer deposition (ALD) on Si substrates.

The structure and dynamics in these devices will be investigated by diffraction and spectroscopic techniques. The spectroscopic techniques include X-ray photoelectron spectroscopy (XPS) and time-of-flight secondary ions mass spectrometry (ToF-SIMS) as tools to investigate the chemical and elemental structures in these thin films.

Different solid electrolytes will be studied including oxidic and sulfidic systems such as $\text{Li}_7\text{P}_3\text{S}_{11}$ and $\text{Li}_{10}\text{GeP}_2\text{S}_{12}$. For powder samples of these electrolytes, the diffusion of Li ions will be investigated by temperature-dependent solid-state ^7Li nuclear magnetic resonance (NMR) spectroscopy/relaxometry/diffusometry.

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