PhD Position

"Investigation of the solid electrolyte interphase on Si/C composites for Li ion batteries"

Starting date: As soon as possible

Contract duration: limited to 3 years

This PhD position is part of the project "InSEIde – Artifical SEI: Understanding and manipulating interfaces in Li ion batteries" funded by the BMBF (young investigator grant) at the Institute for Applied Materials – Energy Storage Systems. In InSEIde, we focus on silicon/carbon composites as anode materials for lithium ion batteries and their SEI layers. The aim is to make this material class a viable, high capacity alternative to the commercially used graphite anodes by designing the interphase.

Your tasks will include the synthesis and characterization of Si/C hybrid materials and the fabrication of electrodes for the material evaluation in Li ion batteries. The project also has a strong emphasis on the SEI characterisation using state of the art techniques such as photoelectron spectroscopy (both in-house and at synchrotron facilities), time of flight secondary ion mass spectrometry as well as microscopy techniques. You will use these techniques to characterize the surfaces and newly formed interphases of the cycled electrodes in dependence of the composite and electrode composition. Furthermore, you will tailor the electrolyte chemistry to improve the cyclability of the Si/C composites.

Your work will also include publishing your results in peer-reviewed international journals as well as presenting them at scientific conferences.

Personal qualification

- Diploma or Master in Chemistry, Material Science/Engineering, Physics or related subjects
- Working experience with lithium ion batteries and electrochemical characterisation preferable
- Experience with surface and interface analytics (XPS, TOF-SIMS) beneficial
- Strong interest in interdisciplinary scientific work
- Very good proficiency in English language, working knowledge of German beneficial

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