



The Institute for Materials Science / Department for Materials Physics is offering a part-time position, preferably beginning October 1st, 2023

PhD student
“microgravimetry of battery solid-electrolyte interphases”

The position will be compensated conform with civil service grade **TVL-E13 (67%)**. It is temporary in compliance with the regulations of German scientific fixed-term contract law (maximum duration 6 years, offering qualification for a PhD).

Solid electrolyte interphases at the contact between liquid electrolytes and battery electrodes are key for the long term stability of the battery device. Sensitivity to atmospheric attack and complexity of the microstructure turn their investigation to an experimental challenge. Recently, we progressed microgravimetry to the in-situ study of SEI films via depositing thin film battery anodes on Quartz oscillators [1,2]. The detailed comparison of mass and charge change even enables a mass spectrometry of the molecular species adsorbed and desorbed during cycling of batteries. Surprisingly, beside Li ions, also adsorption and desorption of other charged molecules contribute significantly to the battery storage [3].

In the new project this method should be extended to battery cathodes, for which even less is known with regard to SEI films and potential side-reactions. Since cathodes need substantial high temperature annealing, the usual Quartz crystal has to be replaced by temperature-stable Languisite crystals, which we would like to test for the first time for the characterization of battery cathodes.

We are searching for a Master chemist or materials scientist who has particular interest in quantitative measurement techniques and possibly has received significant pre-training in materials science and battery materials during her/his Master education.

Women are especially encouraged to apply. Severely handicapped applicants with equivalent qualifications will receive preference.

Please send us your application preferably via email, to the following address:

Prof. Dr. Guido Schmitz
Institut für Materialwissenschaften
der Universität Stuttgart
Heisenbergstraße 3
70569 Stuttgart
matphys@imw.uni-stuttgart.de



- [1] Terwort et al., J. Powersources 336 (2016) 172, <https://doi.org/10.1016/j.jpowsour.2016.10.073>
[3] Wang et al., Journal Powers. 569 (2023) 232919. <https://doi.org/10.1016/j.jpowsour.2023.232919>
[2] Kohler et al., Nanoenergy 84 (2021) 105886, <https://doi.org/10.1016/j.nanoen.2021.105886>