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Concentration profiles in thin films obtained from Neutron Depth Profiling at the PGAA facility

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Neutron Depth Profiling (NDP) is a non-destructive, high-resolution, near-surface analytical technique, which measures concentration profiles of a set of light nuclides like He-3, B-10, Li-6, N-14, O-17 [1]. The high neutron capture-flux density of 3E10 s-1cm-2 at the PGAA beamline enables good measurement statistics on reasonable time scales and opens the possibility towards tracking changing concentration profiles with a high time resolution [2]. We present the method, show the application in several different materials branches and discuss results from an ex situ study of new electrode coating materials for lithium-ion batteries. Special interest here is the incorporation of passivated lithium in solid-electrolyte-interfaces (SEI), where NDP offers the opportunity to monitor the depth dependent SEI evolution. This project is supported by BMBF 05K16WO1.

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Primary authors: TRUNK, Markus; Mr WERNER, Lukas (TUM); Mr WETJEN, Morten (TUM)

Co-authors: Prof. GASTEIGER, Hubert A (TUM); Dr GERNHÄUSER, Roman (TUM); GILLES, Ralph; MÄRKISCH, Bastian (Physik Department, TU München); REVAY, Zsolt (PGAA)

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