

Physical Chemistry at PLUS: Functional Nanomaterials

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The Department of Chemistry and Physics of Materials at the Paris Lodron University of Salzburg (PLUS) capitalizes on its interdisciplinary, access which involves the disciplines chemistry, physics, mineralogy and materials science and which addresses the design and development of inorganic materials, nanomaterials and hybrids including their functional interfaces.[1-4] Furthermore, our research aims at the understanding of growth and stability of metastable nanoscale solids [1] in order to determine their potential use and reliability under realistic operation conditions. In this contribution we will present examples of current projects at the department which will include a) synthetic strategies towards functional nanostructures adopting variable microstructures; [1] b) physical chemistry based characterization approaches that aim at the knowledge-based optimization of the functional properties of nanomaterials; [2,3] and c) the development of cost effective scalable solutions for energy conversion and storage, e.g. in batteries or photoelectrochemical water splitting [4].

[1] A. Feinle, M.S. Elsässer, N. Hüsing, *Chem. Soc. Rev.* 45 (2016) 3377-3399.

[2] T. Berger and O. Diwald, *Defects in Oxide Particle Systems*, in “Defects on Oxide Surfaces” Springer Series on Surface Science, 58 (2015) 273-301.

[3] J. Schneider, T. Berger, O. Diwald., *ACS Appl. Mater. Interf.* 10 (2018) 16836-16842.

[4] S. Dilger, M. Trottmann, S. Pokrant, *Scaling Up Electrodes for Photoelectrochemical Water Splitting: Fabrication Process and Performance of 40 cm² LaTiO₂ N Photoanodes*. *ChemSusChem*, 12 (2019) 1931-1938.