



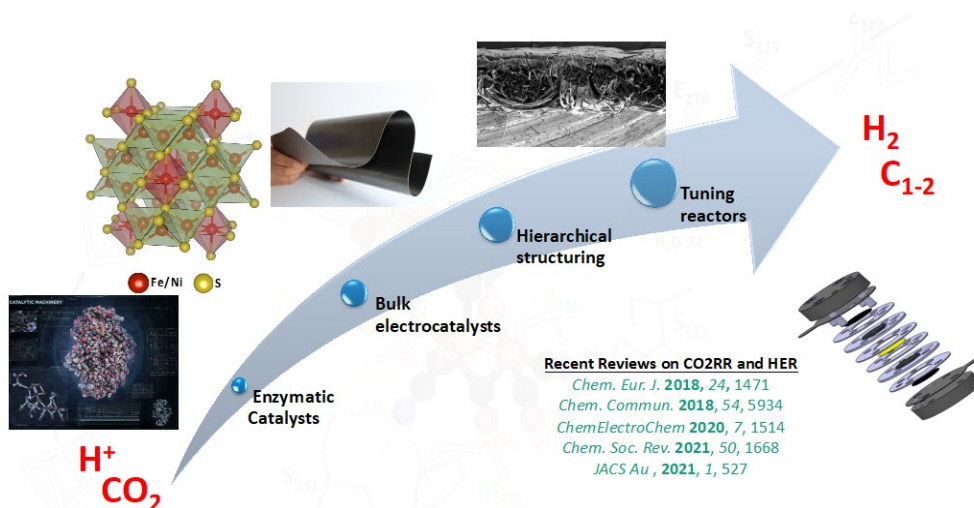
Kolloquium für Physikalische und Theoretische Chemie

Prof. Dr. Ulf-Peter Apfel

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"Scaling electrolysis: from lab-scale and impure feeds to kW-scale demonstration"

The growing societal and political focus on the use of environmentally friendly technologies has led to an ever-increasing interest in electrolysis technologies in the scientific communities. This development is reflected by the plethora of candidate catalysts for the hydrogen and oxygen evolution reactions, as well as the CO₂ reduction reaction, reported in the literature. However, almost none of them entered the stage of application yet. Likewise, the reports on process engineering inadequately address the utilization of these catalysts, as well as electrode and cell concepts, that might be suitable for the market.^[1] Evidently, a holistic approach using proper and optimized electrode designs with novel materials in suitable cells is key towards a future application. We herein show examples on how to form electrodes and incorporate them into zero gap cells for the hydrogen evolution as well CO₂ reduction reaction and reveal key problems on the way towards application.^[2,3,4]



[1] D. Siegmund, S. Metz, V. Peinecke, T. E. Warner, C. Cremers, A. Grevé, T. Smolinka, D. Segets, U.-P. Apfel, *J. Am. Chem. Soc. Au* **2021**, *1*, 527

[2] D. Tetzlaff, K. Pellumbi, D. M. Baier, L. Hoof, H. Shastry Barkur, M. Smialkowski, H. M. A. Amin, S. Grätz, D. Siegmund, L. Borchart, U.-P. Apfel, *Chem. Sci.* **2020**, *11*, 12835 – 12842.

[3] K. junge Puring, D. Siegmund, J. Timm, F. Möllenbruck, S. Schemme, R. Marschall, U.-P. Apfel, *Advanced Sustainable Systems* **2021**, *5* (1), 2000088

[4] L. Hoof, N. Thissen, K. Pellumbi, K. junge Puring, D. Siegmund, A. Mechler, U.-P. Apfel, *Cell Reports Physical Science* **2022**, *3*, 100825.

Mittwoch, 15. Februar 2023, 17 Uhr c.t.
Hörsaal M307 GUZ , Schnarrenbergstraße 94-96
Gäste sind herzlich willkommen.