

EINLADUNG

Im Rahmen der gemeinsamen Kolloquien der Fakultät Chemie und Chemische Biologie der Technischen Universität Dortmund hält

Frau Prof. Dr. Kristina Tschulik Juniorprofessorin für Mikro- & Nano-Elektrochemie an der Ruhr-Universität Bochum

einen Vortrag mit dem Thema

Electrochemistry 3.0 - New Methods for the Production, Characterization and Application of Micro- and Nanoscale Materials

Electrochemistry is a well-established technique for the electrodeposition of thin films for corrosion protection or of 3D structures for integrated circuits. It is also key to most approaches for sustainable energy conversion and it is widely utilized in sensors for the detection and quantification of ions and biomolecules. In this presentation novel concepts will be presented, adopting classical electrochemical methods to fabrication, characterization and utilization of functional materials at the micro- and nanoscale.

The fabrication of structured electrodeposits in the milli- and micrometer range by application of magnetic gradient fields will be used to demonstrate the concept of magnetic field-controlled mass transport in electrochemistry.[1] Electrochemistry will be highlighted as a powerful tool for the characterization of nanoparticles beyond conventional imaging methods using core/shell and alloy particles as an example.[2,3] Advancing from this, single nanoparticle electrochemistry will be introduced to study reactions of and at single nanoparticles in suspensions. Applying single nanoparticle impact studies, otherwise inaccessible insights into nanoparticle reactivity and electrocatalysis can be gained.[3,4]

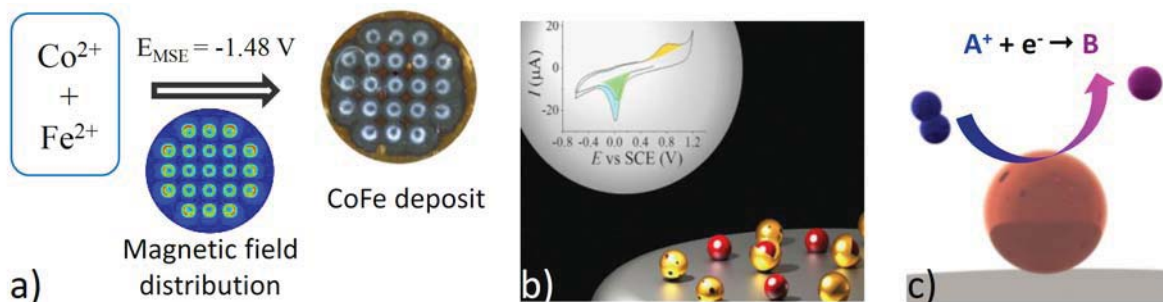


Fig. 1: New methods in electrochemistry: magnetic field controlled structuring of electrodeposits (a), electro-chemical characterization of multifunctional core shell nanoparticles (b) and single nanoparticle catalysis (c).

References:

- [1] F. Karnbach, M. Uhlemann, A. Gebert, J. Eckert, K. Tschulik, *Electrochimica Acta* **2014**, *123*, 477–484.
 [2] K. Tschulik, K. Ngamchuea, C. Ziegler, M. G. Beier, C. Damm, A. Eychmueller, R. G. Compton, *Adv. Funct. Mater.* **2015**, *25*, 5149–5158.
 [3] E. N. Saw, V. Grasmik, C. Rurainsky, M. Epple, K. Tschulik, *Faraday Discuss.* **2016**, in press.
 [4] X. Li, C. Batchelor-McAuley, S. A. I. Whitby, K. Tschulik, L. Shao, R. G. Compton, *Angew. Chem. Int. Ed.* **2016**, *55*, 4296–4299.

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Ort: Campus Nord, Chemiegebäude, HS 1

Für die Dozenten der Chemie

R. Winter

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