



Bundesanstalt für
Materialforschung
und -prüfung

ADLERSHOFER KOLLOQUIUM **Analytik**

FRESENIUS-LECTURE

Topic: **Electrochemistry – the flexible tool box for the construction of hyphenated instrumental analytical systems**

Presenter: **Prof. Dr. Frank-Michael Matysik**
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Chairs: Dr. Rudolf Schneider (BAM) and Prof. Kallol Ray (HUB)

Date: 7 February 2017 2:00 PM

Location: Bundesanstalt für Materialforschung und -prüfung (BAM)
Branch Adlershof, Richard-Willstätter-Str. 11, 12489 Berlin
Building 8.05 / Lecture Hall

Summary: Instrumental analytical methods have experienced a rapid development during recent years. Miniaturization, the increasing impact of mass spectrometry and the implementation of hyphenated systems have become trend-setting routes towards enhanced performance characteristics. Concerning electrochemistry, the design of tailor-made electrochemical systems with a wide variety regarding size, geometry and materials is an essential strength that can be exploited for the construction of hyphenated analytical arrangements. Electrochemical detection (ED) operated in the amperometric mode offers very low limits of detection even in miniaturized detector configurations. Such ED systems can be coupled with capillary-based separation techniques enabling studies of extremely small sample volumes down to the femtoliter range [1]. The combination of electrochemical techniques with mass spectrometry (MS) paves the way for new research directions in material and life sciences [2]. Another strength of electrochemical methods is the spatial resolution that can be realized using scanning electrochemical microscopy for studies of single cells or nanostructured bioactive objects [3]. Finally, electrochemical components can easily be integrated into very complex instrumental systems such as comprehensive two-dimensional separation techniques [4, 5]. In this way electrochemical devices are serving as tools for optimization and interpretation of analytical studies.

References:

[1] J.J.P. Mark, R. Scholz, F.-M. Matysik, *J. Chrom. A* 1267 (2012) 45. [2] R. Scholz, P. Palatzky, F.-M. Matysik, *Anal. Bioanal. Chem.* 406 (2014) 687. [3] S. Bergner, P. Vatsyayan, F.-M. Matysik, *Anal. Chim. Acta* 775 (2013) 1. [4] A. Beutner, S. Kochmann, J.J.P. Mark, F.-M. Matysik, *Anal. Chem.* 87 (2015) 3134. [5] A. Beutner, R.R. Cunha, E.M. Richter, F.-M. Matysik, *Electrophoresis* 37 (2016) 931.

Co-organized with the GDCh-Ortsverband Berlin, Vorsitzender Prof. Kallol Ray, Humboldt-Universität zu Berlin.
A tea round will take place after the lecture to accommodate for personal conversations with the lecturer.

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