NEW TECHNOLOGIES
RESEARCH CENTRE
UNIVERSITY
OF WEST BOHEMIA

INVITATION

New Technologies – Research Centre

Is proud to invite you to the lecture

New ways of looking at solid/liquid interfaces under operating conditions

by

Dr. Slavomír Nemšák

Peter-Grünberg-Institut-6, Forschungszentrum Jülich,52425 Jülich, Germany

A great progress has been made in the development of in-situ and operando experimental methods in the past decade, with ambient pressure photoemission electron spectroscopy being a bright example [1]. By using advanced techniques, such as standing wave excitation and photoemission microscopy, an excellent spatial resolution can be obtained together with valuable chemical and electrical information.

In the first example, the superb depth selectivity and chemical sensitivity of standing wave ambient pressure photoelectron spectroscopy (APPS) is exploited to probe two different solid/liquid interfaces relevant to energy research, electrochemistry, and atmospheric and environmental science [2,3]. Liquid layers were prepared either by water adsorption in a saturated vapor ambiance or using a so-called meniscus method, in which the sample is dipped into and then pulled out of a liquid reservoir leaving a thin liquid film on the sample's surface. The latter experimental configuration allows also for the operando electrochemistry [4].

A traditional concept of differential pumping, which allows photoelectrons to reach the detection in APPS while measuring liquid samples, cannot be simply employed in photoemission electron microscopy (PEEM), mostly due to the presence of a high potential difference between a specimen and extractor lens. One of the ways to overcome this problem is to use a sealed sample, which leaves the vacuum conditions between the lens and sample unaffected [5]. The second demonstration uses top electrodes made of a few-layer graphene, which is highly transparent even for slow electrons. In this configuration, the top electrode acts also as a top seal and the electrochemical cell is built perpendicularly [6]. The combination of operando electrochemistry with PEEM is offering an unprecedented combination of morphological, chemical and structural information with a real-time imaging of electrodes and their interface with liquid.

Date: **7 June 2017**

Time: **13:00**

Venue: **Building C1 Vědeckotechnický park, room TC211, Teslova 5B, Pilsen**

This lecture was supported by the project CEDAMNF, reg. no. CZ.02.1.01/0.0/0.0/15_003/0000358, co-funded by the European Regional Development Fund (ERDF).

EUROPEAN UNION
European Structural and Investing Funds
Operational Programme Research,
Development and Education

MINISTRY OF EDUCATION, YOUTH AND SPORTS