

13th International Conference on Diffusion in Solids and Liquids (DSL-2017), June 26-30, Vienna, Austria

Special Session 10

HYDROGEN-RELATED KINETICS IN MATERIALS (SS10)

Continued annually since DSL-2010. This session discusses broad aspects of hydrogen (H)-related kinetics and H-induced phenomena in materials from a fundamental viewpoint. The aim is to obtain a deeper understanding of dynamical processes such as the atomic-level mechanisms of the reversible hydrogen transportation across the gas/solid interface relevant to hydrogen (hydride) storage, hydrogen purification by permeation, hydrogen isotope retention in plasma-facing materials, and hydrogenation catalysis. Emphasis is also placed on interactions of hydrogen with the micro- or defect structure in the volume of (nano-)materials that can induce drastic physical (mechanical or electrical) property changes but still lack adequate explanations.

In addition to welcoming all subjects below, special topical highlights of the 2017 Session are direct detection techniques for hydrogen (diffusion) dynamics as well as hydrogen-induced electronic effects in semiconductor devices. Both experimentalists and theoreticians are strongly encouraged to participate.

Topics of the special session include:

- H-diffusion (surface and bulk)
- H in nanoparticles and thin films
- Hydrogenation catalysis
- Hydrogen permeation
- Electrochemistry, Fuel cell catalysis
- H-defect interactions
- H-induced vacancy formation and diffusion
- H-embrittlement
- H impact on the tribology of surfaces



Organizer

Prof. Markus Wilde

Institute of Industrial Science, The University of Tokyo, Japan

Introductory Talk: **“Hydrogen Transportation Mechanism across Metal Surfaces Revealed through Thermal Desorption and Nuclear Reaction Analysis - from Hydrogen Absorption to Hydrogenation Catalysis”**

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PLENARY TALK

Prof. Ronald Griessen

Faculty of Sciences, Division of Physics and Astronomy

VU University, Amsterdam, The Netherlands

“Hydrogenography Sheds New Light on the Diffusion of Hydrogen in Metals”



INVITED SPEAKERS

Prof. Astrid Pundt

Institute for Material Physics, University of Göttingen, Germany

„Measurements of Hydrogen Distributions in Nanosized Metals: Hydrogen Microscopy Techniques“



Prof. Gerhard Krexner

Faculty of Physics, University of Vienna, Austria

„ Long-term Hydrogen Storage in Mg and ZK60 after Severe Plastic Deformation “



Prof. Tibor Grasser

Institute for Microelectronics, Vienna University of Technology, Austria

„ Hydrogen-Related Reliability Issues in Electronic Devices “



Dr. Ziyuan Liu

RIKEN, Japan

„A Comprehensive Picture of the Interaction between the Surface and the Buried Interface in Si Film Materials from the Viewpoint of Hydrogen Diffusion“

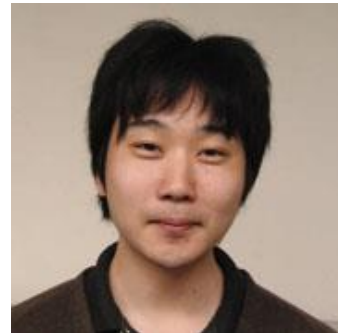


Dr. Hiroshi Akiba

Neutron Science Laboratory, Institute for Solid State Physics

The University of Tokyo, Japan

“Thermal and Neutron Diffraction Studies on Hydrogen Absorption/Desorption Processes in Metal Nanoparticles”



Prof. Milos B. Djukic

Faculty of Mechanical Engineering, University of Belgrade, Serbia

“Hydrogen Embrittlement in Low Carbon Steel and the Synergistic Interplay of the HELP and HEDE Mechanisms”

