chemisch physikalische gesellschaft

Gegründet im Jahre 1869 von H. Hlasiwetz, J. Loschmidt, J. Petzval und J. Stefan

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EINLADUNG

zum Vortrag von

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In-situ Electron Channeling Contrast Imaging (ECCI) to observe the effect of hydrogen in TWIP steels and superalloys

am
Dienstag, 29. Jänner 2019, um 17:30 Uhr

Ort: Lise-Meitner-Hörsaal, Fakultät für Physik, Universität Wien,
1090 Wien, Strudlhofgasse 4 / Boltzmanngasse 5, 1. Stock

Barrierefreier Zugang: Boltzmanngasse 5, Lift, 1. Stock rechts über den Gang zum Hintereingang des Hörsaals

Abstract

Hydrogen embrittlement is one of the key problems for the application of high strength steels and superalloys and, therefore, of high research and technological interest. Nevertheless, several issues prevent from direct investigation of the mechanisms of embrittlement. First, hydrogen is practically invisible to most observation techniques and can, therefore, only be observed indirectly. As a consequence, it is usually not clear whether hydrogen interacts with dislocations, grain boundaries or other defects in a microstructure. Second, hydrogen is highly mobile in microstructures and may, therefore, quickly leave a material during an observation campaign.
The Electron Channelling Contrast Imaging (ECCI) technique applied in SEM may contribute to solve some of these problems, as it allows direct observation and quantification of lattice defects (dislocations, stacking faults, grain boundaries, elastic strain regions) close to the surface of bulk samples. The bulk nature of the sample allows keeping much larger hydrogen quantities in the material than TEM thin foils and enables the performance of (quasi) in-situ deformation experiments.
For our research we observed and quantified the behavior of dislocations and grain boundaries in high Mn-TWIP steels and superalloys with and without hydrogen charging under static and cyclic loading.

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