

# Hydrogen in Materials:Process-Microstructure-Properties Relationships

Lecture:

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Title:

Hydrogen in Materials:Process-Microstructure-Properties Relationships

Target Audience:

Those who are interested in the topic(researchers, students, etc.)

Date and Time:

(Thu), February 29, 2024, 18:00-19:00(JST)

Venue:

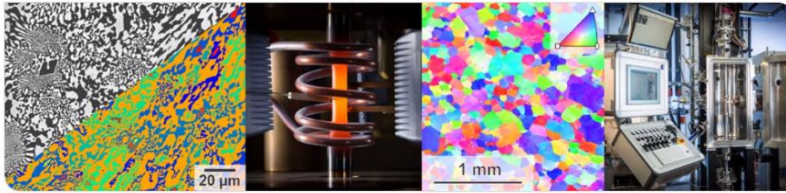
Online(zoom)



Process-structure-property relationships in systems with reduced dimensions

Institute for Applied Materials – Materials Science and Engineering

Prof. Dr. Astrid Pundt – Hydrogen in Materials



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**Bulk metal-hydrogen systems**

Sieverts law:  $S_{H_2} = S_0 \sqrt{p}$  (solid solution)

Isotherm: Pd-H 27 °C

Hydride-phase

Solubility limits

Phase diagram

H. Frieske, E. Wilsch, Ber. Bunsenges. Phys. Chem. 77 (1973) 48  
Prof. Dr. A. Pundt – Sendai, 29.02.2024



**Hydrogen and micro structure**

Interstitial lattice sites (a)

surface (b)

sub-surface (c)

vacancies (d)

grain boundaries (e)

edge dislocations (f)

affect H-solubility limits

Hydride cylinder of 1-2 nm

AP Adv. Eng. Mat. 6 (2006), AP R. Kirchheim Ann. Rev. Mat. Res. (2006), R. Kirchheim AP (2014) chap. 25 in Laughlin, D.E., Hertz, K. (Eds.), Physical Metallurgy, pp. 2567-2705  
Prof. Dr. A. Pundt – Sendai, 29.02.2024

