

## (Virtual) 1st RCM for CRP Hydrogen Permeation in Fusion-relevant Materials

Contribution ID: 35

Type: **not specified**

# Plasma-Driven Permeation of Hydrogen through Materials and Components

*Wednesday, 25 November 2020 14:00 (20 minutes)*

To understand fuel migration behavior in ITER and the Chinese Fusion Engineering Testing Reactor (CFETR), plasma-driven permeation of hydrogen isotope (H) through plasma-facing materials and components are being extensively investigated at the Institute of Plasma Physics, Chinese Academy of Sciences (ASIPP). Permeation parameters of H through tungsten (W), reduced activation ferritic/martensitic steel (RAFMs), copper alloy and vanadium alloy are measured in a systematic manner. Considering reactor operation scenario, various surface condition effects on permeation behavior are investigated. Plasma impurity and neutral H irradiation are taken into account as well. For components, first-of-a-kind experiments of enhanced permeation through plasma-facing component mockups are demonstrated and H retention at the W/Cu interface are studied. Permeation barriers to reduce permeation flux are being developed. In near future, Further measurements of permeation parameters for fusion-relevant materials will be continued under various plasma irradiation conditions. Permeation experiments using a new high flux plasma device and a permeation probe in EAST tokamak are proposed.

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**Session Classification:** Plasma-driven perm. II