

## WP PWIE SP B – kick-off meeting

Minutes 12 February 2025

### SP B.1

- Discussion on the FZJ task on PSI-2 experiments and spectroscopic investigations
  - Chemical erosion possible to be followed via HRS measurements of BD lines?
  - Is it possible to detect other molecules as well? In principle yes – M. Sackers working on this
  - IAP (G. Dinescu) would like to contribute to the activity → mass spectrometry studies more suitable under SP F → action on Antti and Andrey to discuss

**FOLLOW-UP MEETINGS:** None decided but an *update to the W program foreseen in mid-2025* (results obtained, needs for new samples, decision of further exposures etc.) → [see SP B.4](#)

### SP B.2

- Discussion on the CEA task on the analysis of boronization layers
  - In the first phase, 40 boronization samples available for analyses, potentially 40 more after a homogeneous boronization later in 2025
  - **Proposal:** *split the samples into 3 different batches*
    - Representative sets - division NOT by the substrate but by the location of the samples - consisting of 10-15 samples each
    - IBA + microscopy for each of them + SIMS in the end; also XPS can be included in the analysis chain for studying oxygen + carbon presence
    - NB! one needs to analyse the samples deep enough, either by sputter XPS or HAXPES
  - Protecting the samples during transportation: either apply Au coating (~25 nm) on the surface or store the samples in vacuum/in inert atmosphere (argon) for transportation
    - **NB!** this ensures the surfaces being intact only for the 1<sup>st</sup> step of the chain
    - **NB2!** D diffusion may still be different for different substrates
  - Measurements should be performed at regular intervals (2-3 times) before sending them forward in the chain
    - This ensures following the evolution of D diffusion etc. over time – a major bottleneck in the analyses
  - Labs providing availability for measurements → [related to SP B.3](#)
    - MPG – OK for IBA and microscopy
    - FZJ – OK for microscopy and XPS
    - NCSR – OK for IBA and XPS
    - VR – OK for IBA and XPS/HAXPES
    - ENEA – OK for XPS (but not contributing to SP B.2 presently)
    - CIEMAT – OK for SIMS
    - JSI – OK for IBA and XPS but accelerator down in late 2025
    - RBI – OK for IBA but accelerator down in late 2025
- Discussion on the MPG task on the analysis of W7-X samples
  - Several sets of samples becoming available in 2025
    - Boronization samples → MPG (IBA)
    - Dust samples → MPG (SEM) → *other labs?*
    - Entire tiles → MPG (IBA), 10 × 10 cm<sup>2</sup> → *other labs?*

- MPM samples → FZJ ( $^{13}\text{C}/^{15}\text{N}$  studies) → *other labs?*
- IPPLM already available for analysis of dust from W7-X

**FOLLOW-UP MEETINGS:** (i) Analysis chain for WEST boronization samples, (ii) possible analysis needs for the identified W7-X samples

### SP B.3

- See discussion under SP B.2

**FOLLOW-UP ACTION:** Consider adding the indentation and phase-change studies in the task descriptions for 2025 (and in following years)

### SP B.4

- W samples and their production needs to be further discussed in mid-2025 → action on Antti to organize, also take the wishes from SP X into account
  - Include also implantation of W samples with D into the list
    - **NB!** IST has a capability for microbeam measurements
- B samples and their production mainly according to the matrix published in December 2024
  - New idea to investigate oxidization of B layers → IST + IAP
    - Thickness from 100 nm to 500 nm
    - Samples stored in inert gas (argon) or in vacuum during transportation to IST
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**FOLLOW-UP MEETINGS:** (i) discussion on further needs for W samples – includes SP X collaboration, (ii) follow-up event on B samples and the obtained results in late 2025

### SP B.5

- Dust particles in fusion devices are always different → action on Antti and the SP B community to think about physics questions where to put the focus on
  - Sample location?
  - Droplets?
  - Something else?
- Dust samples from WEST should be available for shipment after December, dust collection expected in May
- No progress made yet for the UKAEA task – pending for solving problems related to sample handling

**FOLLOW-UP MEETINGS:** meeting with different labs for (i) analysis needs and (ii) analysis chain for AUG, WEST, and W7-X dust

### SP B.6

- No specific issues raised