# 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 1st 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
    - *NCSRD* – 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 cm2 🡪 *other labs?*
    - MPM samples 🡪 FZJ (13C/15N 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

**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