

# Meeting of participants in the IAEA tungsten CRP on 29 May 2014 at PSI in Kanazawa

Present: Ch. Grisolia, M. Mayer, B. Unterberg, J. Linke, Y. Hatano, M. Sakamoto, T. Oda, Yu. Gasparyan, A. Pisarev, B. Khripunov, B. D. Wirth, M. Shimada, H.-K. Chung, W. Jacob, Th. Schwarz-Selinger, G.-H. Kim.

Notes by H.-K. Chung and Y. Hatano.

## 1. Discussion about dates and place for the 2nd RCM

It is suggested to hold the 2nd Research Coordination Meeting (RCM) at Seoul National University, subject to agreement between SNU and IAEA. SNU is reached by a direct bus service from ICN international airport.

Recommended dates: September 2015 in connection with the 12th International Symposium on Fusion Nuclear Technology (ISFNT) in Jeju island 14-18 September 2015.

Dates could be before (Wed-Fri 9-11) or after (Mon-Wed 21-23) the week of Jeju meeting or during the week of Jeju meeting (e.g. Thu-Sat 17-19) -- need to decide depending on the participation of CRP members. We will poll CRP members and identify the best set of dates soon so that SNU facilities may be reserved.

(Note after the discussion.) A poll has been set up on the Doodle web site:

<http://doodle.com/nb6k54khnvryrrp3>

We ask there for your availability for a meeting of 3 or 4 days at SNU within the period 8-24 September 2015. Please visit this poll and provide the information.

## 2. Two actions are required from CRP members. Here summarized are some discussions over lunch on two actions.

### 1) Provide an inventory (Excel sheet) of possible common materials and wish list

- Tungsten standard samples to be used for comparative studies: a) Forged samples may have problems due to the differences in microstructures and mechanical properties between the center and edges. b) Recrystallized tungsten may be feasible if the thickness is large enough to overcome the brittleness after neutron irradiation. c) Tungsten sample with as least natural defect as possible. d) Possibly same production procedure by same manufacturer.
- Sample preparation and material preparation need care: a) Recrystallisation procedures (vacuum, hydrogen atmosphere etc). b) Machining procedures. (Electrical discharge machining (EDM) may produce cracks, polishing procedures needs care.)
- Benchmark experiment for modeling comparison: a) One experiment with single crystal tungsten needed. b) Clean damage by high energy electron beam for threshold displacement energy, well defined dpa values. c) Hydrogen isotope exchange experiment for benchmark case.
- TDS analysis modeling comparison activities: a) Among modeling capability (DFT, MD, kMD and Rate model). b) Between modeling and experiments.

## 2) Provide a list of possible contributions

- Materials: Jülich has ITER Grade monoblock to provide to CRP members. Other parties can also propose to supply materials using the possible common material supply list with microstructure information.
- Samples: a) Gasparyan and Mayer are creating high energy electron beam to create point defects. b) High energy electrons cannot simulate neutron damage because it induces only Frenkel pairs and not collision cascades, but it could be good for benchmarking of modeling because of simpler defect structure. c) Irradiation effects in the bulk may play only minor roles in PSI if PSI is dominated by microstructure change in the first 50 nm induced by helium bubble growth. However, tritium retention and permeation could be controlled by the bulk properties.
- Microstructure information needed.
- TDS data analysis meeting: possibly at ORNL hosted by B. Wirth in 1Q of 2015 (likely in March).