



Contribution ID: 3

Type: Oral presentation

Experimental investigation of radiation damage effects in beryllium: updates on recent results obtained on proton, neutron and He-ions irradiated samples

Tuesday, 10 December 2019 12:45 (25 minutes)

Beryllium is an essential material for target components material in the currently running (NuMI) and near-future multi-megawatt accelerator particle sources (LBNF), reflectors and moderators in material testing nuclear reactors, plasma facing material (JET, ITER) and potential neutron multiplier (DEMO) for fusion reactor designs, and it is under extensive investigation by fission, fusion reactors and proton accelerator facilities communities.

The presentation gives an overview of the recent results obtained in the Materials Research Facility of the UKAEA on beryllium samples:

- exposed to high energy protons in the NuMI beamline at 50°C (maximum dose 0.5 dpa, 2000 appm of helium transmutant);
- after helium implantation at 50°C and 200°C (0.1 dpa, 2000 appm of helium);
- after neutron irradiation at different DEMO relevant conditions during HIRDOBE-2 campaign in the HFR and investigated within the collaboration with Karlsruhe Institute of Technology (Germany).
- after thermal-shock experiments in the HiRadMat facility.

The main part of the paper will be devoted to the micromechanical tests results obtained using nanoindentation hardness measurements and microcantilevers fracture tests. The local properties data will be analyzed in combination with observed microstructural changes. The presentation will also give an overview of the future plans.

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Session Classification: 5th oral session