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# Research on radiation damage of fusion relevant materials carried out at Warsaw University of Technology

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The urgency of obtaining materials capable of long time operation in a fusion reactor in view of the foreseen construction of DEMO is justifying the need for fusion materials irradiation facility and study of the materials degradation under intensive, high energy neutron fluxes. Tungsten is foreseen as a plasma facing material for ITER and DEMO [1] because of its low sputtering yield, high melting point and high thermal conductivity. In the machine, it will not be used as a structural part, thus degradation of its mechanical properties due to neutron irradiation, though important, are not of the primary concern. However, as tungsten tiles will be operating in the direct exposure to plasma, tritium fuel retention is of key importance for the safety aspects of fusion power plant operation [2].

The retention of hydrogen isotopes in tungsten is altered during material irradiation and service resulting in development and annihilation of radiation damage and H/D/T traps [3, 4]. The results of the studies [5, 6] of radiation damage and the evolution of the microstructure of tungsten ITER grade targets carried out at Warsaw University of Technology in the scope of EURATOM programme will be presented. Lamella preparation using focused ion beam and dislocation density evolution as observed under transmission electron microscope will be discussed in context of hydrogen isotope retention.

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