

# Deuterium Depth Profile Measurement in Pre and Post Irradiated Tungsten

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Tungsten (W) will be used in ITER as a Plasma Facing Material (PFM) in divertor due to its capability to handle high heat flux while having a low Hydrogen (H) isotope affinity. However in presence of fusion neutrons and alpha particles, tungsten can accumulate radiation damage, which might significantly enhance its H retention property. In order to investigate the effects of radiation damage on Deuterium (D) trapping in tungsten, we have carried out experiments using D beam in pre and post irradiated polycrystalline tungsten foils. In this paper we present the comparison of D depth profile measurements using Elastic Recoil Detection Analysis (ERDA) and Secondary Ion Mass Spectroscopy (SIMS) technique.

Polycrystalline tungsten foil samples of size 8mmx8mmx0.1mm foils were mechanically polished and annealed at 1838 K to release the stress and to minimize the defects. These foils were further irradiated with gold ion (80 MeV), boron ions (10 MeV) to create defects. These samples were then exposed to a D beam of 100keV energy for a fluence of  $5 \times 10^{17}$  ions/cm<sup>2</sup>. The trapped D was measured using ERDA and SIMS, and the depth profiles were modelled using binary collisions Monte Carlo method by including the surface roughness. The preliminary results show the enhancement in amount of trapped D in pre-damaged tungsten samples in contrast to the undamaged ones. The effect of Helium (He) on D trapping in sample was also analyzed and it was observed that D trapping is reduced in presence of He. The details of experiments and the analysis will be presented.

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