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Category Number and Subject: 5.4.0 Divertors, edge physics, and fueling

Theory Experiment

Tritium Recovery From Carbon Co-deposits: *ex situ* Studies in Preparation for an *in situ* Thermal Oxidation Experiment in DIII-D* C. Tsui, J.W. Davis, A.A. Haasz, B.W.N. Fitzpatrick, A.G. McLean, P.C. Stangeby, Y. Mu, *U. Toronto*; S.L. Allen, *LLNL*; W.P. West, P.L. Taylor, K.L. Holtrop, A.W. Hyatt, R.L. Boivin, *GA*; K. Umstadter, *UCSD* – Tritium trapping in carbon co-deposits is potentially a major cause of T retention in ITER. A possible solution is “thermo-oxidation,” involving sub-atmospheric molecular O₂ at 250°-350°C. Ex situ lab tests (at U. Toronto) of graphite tiles removed from DIII-D have demonstrated the method in principle and generated a comprehensive database on removal rates. Ex situ tests were also performed for special components (e.g., diagnostic mirrors) used in DIII-D to assess potential damage. The next step is in situ demonstration in DIII-D to show that the D (as proxy for T) and C removed from the tiles actually leaves the vessel, that vessel components are not damaged, and that plasma operation can be recovered quickly. Lab results and implications for the in situ test are discussed.

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