Thermal Oxidation Experiments Aimed at Understanding Tritium Recovery Based on ^{13}C-Tracer Experiments in DIII-D, JET, C-Mod, and MAST*

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Retention of tritium in carbon co-deposits is a serious concern for ITER. Developing a reliable in-situ removal method of the co-deposited tritium would allow the use of carbon plasma-facing components which have proven reliable in high heat flux conditions and compatible with high plasma performance. Thermal oxidation is a potential solution, capable of reaching even hidden locations. It is necessary to establish the least severe conditions to achieve adequate tritium recovery, minimizing damage and reconditioning time. The first step in this international project is ^{13}C-tracer experiments in DIII-D, JET, C-Mod and MAST. $^{13}CH_4$ is injected toroidally symmetrically, facilitating quantification and interpretation of the results. Tiles are then removed, analyzed for ^{13}C content and subsequently evaluated in a thermal oxidation test facility with regard to the ability of different severities of oxidation exposure to remove the different types of (known and measured) ^{13}C co-deposit. Removal of D/T from B on Mo tiles from C-Mod will also be tested. OEDGE interpretive code analysis of the ^{13}C deposition patterns is used to generate the understanding needed to apply findings to ITER. First results are reported for the ^{13}C injection experiments in DIII-D.

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