Chemical Erosion Of DIII-D Lower Divertor Tiles

Graham Michael Wright; University of Toronto

CUflF-q 718 90 - - - UNT Digital Library 1 Summary of carbon E/R rates in DIII-D lower divertor for attached (red) and detached (black) divertor. Hatched areas from height measurements on DIII-D tiles Chemical erosion of DIII-D lower divertor tiles - ResearchGate Ceramic Matrix Composites: Materials, Modeling and Technology - Google Books Result DiMES Studies of Temperature Dependence of Carbon Erosion and . Measurements of chemical erosion of ATJ graphite . terizing the divertor environment, chemical erosion of ite tile samples recently removed from the DIII-D. Nuclear Fusion Research: Understanding Plasma-Surface Interactions - Google Books Result The chemical erosion properties of DIII-D tokamak graphite tiles are examined . Inferred yields in detached (Te 2 eV) plasmas are much lower (~0.01%) than DIII-D divertor tile samples are exposed in the PISCES-B linear plasma device. Get PDF (502K) - Wiley Online Library The Effect Of Detachment On Carbon Divertor Erosion/Redeposition . Oct 4, 2006 . deuterium co-deposition in the DIII-D divertor was observed under detached conditions. A insertion of material samples into the lower divertor floor, exposing chemical re-erosion, two exposures of the tile gap sample were Chemical erosion of DIII-D divertor tile specimens . Measurements for 50 eV/D + incident on the lower divertor resulted in erosion yields which are the same as Measurements of chemical erosion of ATJ graphite by low energy D . Aug 16, 2010 . lower divertor of DIII-D to study integrated plasma materials interaction diagnostics. (b) DiMES sample, metallic films and surrounding graphite tile . were found to have a chemical erosion yield, Ychem 1s 3-58, consistent Engineering, Aerospace upper limit of Y 5 0.1% for the chemical sputtering yield. 1) Typical divertor net erosion rates of graphite in DIII-D during attached plasma to the tiles of the DIII-D lower divertor, which are also graphite (Union-Carbide ATJ), making. Chemical Erosion in DIII-D - TSpace - University of Toronto . of divertor attachment to study carbon erosion in the DIII-D tokamak divertor. higher Ychem than the divertor tiles despite identical incident plasma conditions. Microwave discharges at low pressures and peculiarities of the processes in MkIIA divertor, using 'reference' chemical erosion yields of order 1% – while higher than . mas on DIII-D [9] with ne . Due to relatively low D? fluxes to tile 4 –. A Detailed Study of Carbon Chemical Erosion in L . - IOPscience Technical Paper / DIII-D Tokamak - Plasma Heat and Particle Exhaust . and energy fluences have reduced the chemical erosion yield of lower-divertor tiles. inserted into the lower divertor of DIII-D and exposed to selected plasma discharges. Net material In particular, increased chemical erosion by cold hydrogenic atoms at featuring a simulated tile gap 2 mm wide and 15 mm deep (Fig. 1). Chemical erosion of DIII-D lower divertor tiles - ScienceDirect.com The evolution of carbon release from the DIII-D lower divertor tiles is studied using . This result indicates that a substantial reduction in carbon chemical erosion, DiMES Contributions to PMI Understanding - Purdue University JET are described along with the plans for the new Mark I1 divertor probe . very valuable for divertor physics and was essentially duplicated on JT60 and DIII-D. These consisted of 16 single Langmuir probes in the upper and lower X-point tiles. . measurements of target tile erosion [4] which showed that chemical. ?[PDF]Suppression of net erosion in the DIII-D divertor with detached . Mar 15, 2001 . Suppression of net erosion in the DIII-D divertor with detached plasmas Chemical erosion of DIII D lower divertor tiles · Study of gross and net Plasma-Surface Interaction Studies on DIII-D and Their Implications . Spectroscopic measurements in the DIII-D lower divertor have shown an order of magnitude decrease in the brightness of the CD emission band over the course . format psi Nov 7, 2005 . erosion due to sputtering, including chemical sputtering for a C wall [25]. .. are performed at the end of experimental campaigns so that tiles may . deuterium fuelled detached divertor operation in DIII-D (lower part of figure A detailed study of carbon chemical erosion in L-mode plasmas in . Apr 3, 2009 . hydrocarbon dissociation and transport in the DIII-D tokamak. Citation into the DIII-D lower divertor in a manner imitating natural release by chemical erosion. emitted by chemical sputtering from surrounding carbon tiles. The distributed impact on graphite with chemical erosion yields, Ychem. C. , as. Advances in the modeling of chemical erosion/redeposition of . ?Porous plug gas injection systems for studies of hydrocarbon dissociation and transport in the DIII-D tokamak. used to inject methane into the DIII-D lower divertor in a manner imitating natural release by chemical erosion. to that seen by hydrocarbons being emitted by chemical sputtering from surrounding carbon tiles. profiles observed in DIII-D's graphite-tiled divertor under low power, L-mode . hydrocarbon molecules generated by chemical erosion of divertor tiles under the Recent Results on Carbon Erosion, Migration and Re-deposition in . Nov 30, 2004 . Spectroscopic measurements in the DIII-D lower divertor have shown an order of magnitude decrease in the brightness of the CD emission Downloadable Full Text Sep 17, 2003 . DIII–D. A detailed study of carbon chemical erosion in carbon erosion in the DIII-D divertor Langmuir probe clusters on lower divertor tiles. Reduction of divertor carbon sources in DIII-D Material erosion and migration in tokamaks - CRPP www 7, 4, AACMQ84110, Chemical erosion of DIII-D lower divertor tiles, Wright, Graham Michael, UNIVERSITY OF TORONTO (CANADA), MASc, 2003, 43. Imp. Control - The FIRE Place - Princeton Plasma Physics Laboratory At 200º C carbon deposition down a simulated tile gap was reduced by about a factor of 2 . Micron size carbon dust introduced in the lower divertor of DIII-D penetrated core plasma Chemical erosion rate of carbon and hydrocarbon films by measurement of ci kinetic temperature in methane puffing . - CiteSeer DIVERTOR EROSION IN DIII-D '& - OSTI gives a constant divertor tile surface temperature. phase. neutron energy spectrum and lower temperatures than we anticipate on chemical erosion,7 radiation-enhanced sublimation,8*g .. iter and divertor on both DIII-D (Ref. 22) and Observations on chemical erosion in DIII-D and PISCES - IOPscience DIII-D DiMES and MiMES Materials Evaluation Systems - SUNIST Quantification of Chemical Erosion in the Divertor of the DIII-D Tokamak. Doctor of with a detached divertor, i.e., a low chemical sputtering yield. Results and Figure 35: Chemical erosion yield for plasma-exposed graphite tiles vs. surface. Chemical erosion of DIII-D divertor tile specimens erosion, and the

corresponding deuterium retention of long term exposure tiles in DEI-D. Deuterium taken from divertor tiles mounted in DIII-D for a full year's campaign. Along with . DiMES sample along the major radius of DIU-D lower divertor. . This is an important parameter for both chemical erosion and deuterium. Porous plug gas injection systems for studies of hydrocarbon . May 6, 2008 . DIII–D Divertor Diagnostics and Erosion/Redeposition. Measurements SOL/ edge ne, Te. (including very low Te in detached plasma),.