

Suppression of hydrogenated carbon film deposition by scavenger techniques and their application to the tritium inventory control of fusion devices

Abstract: The well-known radical and ion scavenger techniques of application in amorphous hydrogenated carbon film deposition studies are investigated in relation to the mechanism of tritium and deuterium co-deposition in carbon-dominated fusion devices. A particularly successful scheme results from the injection of nitrogen into methane/hydrogen plasmas for conditions close to those prevailing in the divertor region of present fusion devices. A complete suppression of the a-C: H film deposition has been achieved for N-2/CH₄ ratios close to one in methane (5%)/hydrogen DC plasma. The implications of these findings in the tritium retention control in future fusion reactors are addressed