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Dependence of impurity accumulation on Ip and the outer gap in the presence of lithium deposition in NSTX[1] STEPHEN PAUL, M.G. BELL, S.P. GERHARDT, H.W. KUGEL, J. KALLMAN, R. KAITA, J.A. ROBINSON, Princeton Plasma Physics Laboratory, NSTX TEAM — Shortly after commencing evaporation of a lithium coating onto the carbon surfaces of the lower divertor and other plasma-facing components in NSTX, a reduction in the frequency of ELMs was observed, eventually resulting in complete suppression for periods up to about 1s as deposition continued. Co-incident with ELM suppression, the effective ion charge increased as a result of a buildup in carbon, though lithium itself remained at a low level in the core. Radiated power steadily increased as medium-Z metallic impurities, notably iron, accumulated in the core of the plasma. This phenomenon may occur in these NBI-heated, deuterium H-mode plasmas because the lithium coating modifies the recycling of hydrogenic species, affecting the plasma's edge and scrape-off layer. Another possibility, the role of sputtering from metal surfaces by fast beam ions introduced by NBI heating, has been investigated by changing the amount of fast beam ion loss by varying the plasma current, neutral beam tangency radius and the gaps between the plasma boundary and surrounding components. Results from bolometry and XUV spectroscopy show that the plasma current affects accumulation of metals much more strongly than the gap between the plasma and the outer limiter.

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