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Core Impurity Transport in C-Mod L-, I- and H-mode Plasmas¹ J. RICE, M. REINKE, C. GAO, N. HOWARD, M. CHILENSKI, MIT/PSFC, L. DELGADO-APARICIO, PPPL, R. GRANETZ, M. GREENWALD, A. HUBBARD, J. HUGHES, J. IRBY, Y. LIN, E. MARMAR, R. MUMGAARD, MIT/PSFC, S. SCOTT, PPPL, J. TERRY, J. WALK, A. WHITE, D. WHYTE, S. WOLFE, S. WUKITCH, MIT/PSFC — Core impurity transport has been investigated for a variety of confinement regimes in C-Mod plasmas from x-ray emission following laser blow-off injection of medium and high Z materials. In Ohmic L-mode discharges, impurity transport is anomalous $(D_{eff} >> D_{nc})$ and changes very little across the LOC/SOC boundary. In ICRF heated L-mode plasmas, the core impurity confinement time decreases with increasing ICRF input power (and subsequent increasing electron temperature) and increases with plasma current. Nearly identical impurity confinement characteristics are observed in plasmas with I-mode confinement. In EDA H-mode discharges the core impurity confinement time is much larger, but exhibits a similar scaling with plasma current, although there is a covariance with the density. There is a strong connexion between core impurity confinement time and the edge density gradient. Central impurity density profiles in these stationary regimes are often flat, in spite of large amplitude sawtooth oscillations, and there is little evidence of impurity convection inside of r/a = 0.3.

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