Abstract Submitted for the DAMOP06 Meeting of The American Physical Society

Enhancement of the 1s2s2p ⁴P State Associated with Electron Transfer in 1-2 MeV/u $C^{4,5+}$ + He and Ne Collisions D. STROHSCHEIN, D. GARVIN, J. BARAN, J.A. TANIS, Western Michigan Univ. — Auger electron emission spectra produced in collisions of 0.5, 1.5, and 2 MeV/u $C^{4,5+}$ with He and Ne targets were investigated. The measurements were conducted at Western Michigan University using the tandem Van de Graaff accelerator. Auger electrons emitted at zero degrees were detected using a high-resolution parallel-plate electron spectrometer located downstream from the target cell. Intensities of the autoionizing metastable (1s2s2p) ⁴P state were found to be strongly enhanced relative to the similarly configured (1s2s2p) $^{2}P_{-}$ and (1s2s2p) $^{2}P_{+}$ states in single and double electron transfer to $C^{4+}(1s2s \ ^{3}S)$ and $C^{5+}(1s^{2})$, respectively, in agreement with earlier results for $\sim 1 \text{ MeV/u } \text{F}^{7,8+}$ ions¹. For single transfer the 1s2s2p intensities produced in the mixed-state beam $C^{4+}(1s^2+1s2s^3S)$ were compared with the intensities for the ground-state beam $C^{4+}(1s^2)$ to extract the contribution due solely to the 1s2s ³S metastable beam. The role of Pauli exchange¹ in leading to enhancement of the ⁴P state is considered along with other mechanisms. ¹J.A. Tanis *et al.*, Phys. Rev. Lett. 92, 133201 (2004).

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