Abstract Submitted for the DAMOP06 Meeting of The American Physical Society

Reactive collisions of atomic antihydrogen with H, He⁺, He, H₂⁺, and H₂ JAMES S. COHEN, Los Alamos National Lab — The fermion molecular dynamics (FMD) method has been used to determine the rearrangement and destruction cross sections for collisions of antihydrogen (\bar{H}) with H, He⁺, He, H₂⁺, and H₂ at collision energies above 0.1 au. The results for the H and He⁺ targets satisfactorily merge with previous calculations done for lower collision energies. There are no previous calculations for the other targets. Despite the absence of a critical distance, the destruction cross section for collisions of \bar{H} with He is found to be comparable with the destruction cross sections for \bar{H} collisions with H and He⁺, for which there are critical distances. The three atomic cross sections are shown to be given quite reasonably by simple classical orbiting formulas at energies that are very low but still high enough for L > 0 partial waves to be dominant. The cross sections for formation of the antiprotonic atoms (Pn or \bar{p} He) and their initial quantum numbers are found to be significantly different from the analogous cross sections for \bar{p} projectiles. The cross sections for the molecular targets are significantly larger.

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Date submitted: 06 Feb 2006

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