AU Rosen, S, Peverall, R, Larsson, M, Le Padellec, A, Semaniak, J, Larson, A, Stromholm, C, van der Zande, WJ, Danared, H, Dunn, GH
TI Absolute cross sections and final-state distributions for dissociative recombination and excitation of CO+ (v=O) using an ion storage ring
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ID DIELECTRONIC-RECOMBINATION; TEMPERATURE-DEPENDENCE; RADIATIVE LIFETIMES; CARBON-MONOXIDE; RYDBERG STATES; 115 NM; PHOTODISSOCIATION; COEFFICIENTS; ELECTRONS; FRAGMENT
AB Absolute cross sections and rate coefficients have been determined for dissociative recombination of electrons and CO+ ions for energies from 1 meV to 54 eV. We found values of 4 x 10(-12) cm(2) at 1 meV and 10(-15) cm(2) at 1 eV, with an essentially 1/E energy dependence. Branching ratios over the final atomic product states have been determined using a position-and time-sensitive imaging system. At zero eV collision energy the predominant yield is to ground-state atomic fragments (76%). At higher collisional energies the branching ratio to the ground-state Limit is reduced. A new limit, O(D-1)+C(D-1), opens up and branching to the O(P-3) +C(D-1) limit increases. Cross sections are also determined for dissociative excitation of CO+. Thermal rate coefficients are deduced from the dissociative recombination (DR) data, and compared with measurements in the literature. Consideration of both the theoretical and spectroscopic data in the literature giving information about the potential curves along which DR may take place reveals both a paucity and disparity of the data.
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