

AU Sheehan, C, Le Padellec, A, Lennard, WN, Talbi, D, Mitchell, JBA

TI Merged beam measurement of the dissociative recombination of HCN⁺ and HNC⁺

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DT Article

ID STIMULATED RADIATIVE RECOMBINATION; ABSOLUTE CROSS-SECTIONS;
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SPECTRUM; CH₅⁺; BAND

AB Cross sections for the dissociative recombination of isomeric HCN⁺/HNC⁺ ions with electrons were measured using the single-pass merged beam experiment located at the University of Western Ontario in Canada. The source conditions were varied so that an HCN⁺/HNC⁺ mixture was first studied. The HNC⁺ ion was then isolated via the fast ion-molecule reaction HCN⁺ + CO₂ --> HNC⁺ + CO₂. The two sets of measurements, which both refer to vibrationally (and electronically) excited states of HCN⁺ and HNC⁺, exhibit differences in the magnitudes of the cross sections. Thermal rate coefficients have been calculated for both species. An attempt has been made to identify the valence states involved in the dissociation to the CN + H channel for HCN⁺ recombination.

C1 Univ Western Ontario, Dept Phys & Astron, London, ON N6A 3K7, Canada., Ecole Normale Super, Dept Phys, LETMEX, F-75005 Paris, France., Univ Rennes 1, UMR PALMS, F-35042 Rennes, France.

RP Sheehan, C, Univ Western Ontario, Dept Phys & Astron, London, ON N6A, 3K7, Canada.

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PA DIRAC HOUSE, TEMPLE BACK, BRISTOL BS1 6BE, ENGLAND

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