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TI A storage ring study of dissociative excitation and recombination of D-3(+)

SO PHYSICA SCRIPTA

LA English

DT Article

ID PRODUCT-STATE DISTRIBUTIONS; DIELECTRONIC RECOMBINATION; CROSS-SECTIONS; H-3(+); H-3+; ION; (HEH+)-HE-4; BEAM; H3+

AB Dissociative recombination and excitation of D-3(+) have been studied in CRYRING, a heavy-ion storage ring at the Manne Siegbahn Laboratory at Stockholm University. The measured cross section for dissociative recombination was used to deduce a 300 K rate constant of 2.7×10^{-8} cm³ s⁻¹. This is a factor of four smaller than the corresponding value for H-3(+) measured earlier in CRYRING. Dissociative excitation into both the D and 2D channels (D + D or D-2) were studied. The 2D channel occurs at energies below threshold for the ion's dissociative states, which indicates that resonant enhanced dissociative excitation via autoionizing resonances takes place. No measurable effect could be observed for the dissociative recombination cross sections when an electric field of 30 V/cm was applied to the electron-ion interaction region.

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NR 49

TC 6

PU ROYAL SWEDISH ACAD SCIENCES

PI STOCKHOLM

PA PUBL DEPT BOX 50005, S-104 05 STOCKHOLM, SWEDEN

SN 0281-1847

J9 PHYS SCR

JI Phys. Scr.

PD FEB

PY 1998

VL 57

IS 2

BP 215

EP 221

PG 7

SC Physics, Multidisciplinary

GA YW677

UT ISI:000071961500010