Intercomparison of Storage Rings: HD^+ at ASTRID, CRYRING and TSR

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HD^+ is a molecule that has been studied many times before. The different storage rings, ASTRID in Aarhus, CRYRING in Stockholm and TSR in Heidelberg, have reported results that differed in details [l]. Especially, the magnitude of the high-energy peak (between 5 and 20 eV) and the cross section just before this peak were not in agreement among the rings. Variations have been explained by differences in stripping of atoms in high Rydberg states in the dipole magnet following the cooler section and by differences in the implementation or the consequences of the target geometry (toroïdal correction). This study tries to settle the result and to establish an estimate for the reliability of absolute cross section determinations by heavy ion storage rings. The ion beam energy has been chosen to be 1 MeV/amu. The results are in good agreement. The result from CRYRING and TSR is very close in the whole range of collision energy but the ASTRID result show still some difference in the high energy peak. The valley region shows a difference between CRYRING, TSR and ASTRID but reveals remarkable fine structure reproduced at CRYRING and TSR.

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[1] L.M. Andersen, P.J Johanson. D. Kella, H.B. Pedersen and L. Vejby-Christensen Phys. Rev. A **55** 2799 (1997)