

AU Andersson, K, Hanstorp, D, Neau, A, Rosen, S, Schmidt, HT, Thomas, R, Larsson, M, Semaniak, J, Osterdahl, F, Danared, H, Kallberg, A, Le Padellec, A

TI Electron impact single detachment on the F⁻ ions using the heavy ion storage ring CRYRING: Cross-section determination

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AB Electron Impact Single Detachment (EISD) of F⁻ has been studied using the heavy ion storage ring CRYRING at the Manne Siegbahn Laboratory, Stockholm, Sweden. F⁻ ions stored in the ring were merged with an electron beam in one of the ring sections. Neutral F atoms produced in the EISD process were detected in the zero-degree direction using a surface barrier detector. The threshold for the detachment process was found to be around 7.6 eV, thus more than twice the binding energy of F⁻. The cross-sections increased smoothly up to 55 eV where it reached a maximum of 1.9×10^{-16} cm². At higher energies slow decrease of the cross-section was observed. which follows the energy dependence predicted by the Bethe-Born approximation. The experiment showed that CRYRING can be used favourably for studies of anions, and several experiments are forthcoming.

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