

ELECTRON CAPTURE INTO EXCITED STATES FOR
 $\text{Al}^{8+} + \text{H}_2$ COLLISIONS AT 3 keV/amu

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The MINIMAFIOS ECR source at Grenoble has recently produced stable beams of highly charged Al^{8+} . We have studied electron capture into excited states for Al^{8+} ions extracted at 10 kV colliding with an H_2 molecular target under single collision conditions. Using a grazing incidence spectrometer covering the region 250 Å to 1100 Å, we have made a relative intensity measurement of the radiative decay from excited (nl) states of Al^{7+} following the charge exchange collision. The Al^{7+} spectra show known transitions from the $1s^2 2s 2p^3$ excited state. We discuss the presence of the $1s^2 2s 2p^2 (^4P)$ metastable state in the incidence Al^{8+} beam. The spectra also show many transitions which up to now are unidentified, in particular transitions for the wavelength region between 300 and 400 Å and that between 600 and 700 Å. To identify the transitions, we compare our spectrum with preliminary theoretical wavelengths calculated using the multiconfiguration Dirac-Fock method including transitions from $n = 3, 4$ and 5. These preliminary results reveal transitions from $n = 5$ to 4 for the observed spectra in the 600 Å region and transitions from $n = 4$ to 3 for the observed spectra in the 300 Å region.

REFERENCE

- ¹Chetioui, A., Delaunay, M., Dousson, S., Geller, R., Jacquot, B., Hitz, D., Vernhet, D., to be published, Nuclear Instruments and Methods.