Abstract Submitted
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Differential cross section ratios for p + He collisions[1] MICHAEL SCHULZ, University of Missouri-Rolla, AHMAD HASAN, UAE University, TIBOR VAJNAI, Kecskemet College, MIROSLAV ZAPUKHLYAK, TOM KIRCHNER, TU Clausthal — We have measured differential cross sections for single capture, double capture, and transfer excitation in p + He collisions. In the double to single capture cross section ratios R_{DC} we observe peak structures around 0.5 to 1.0 mrad similar to those reported previously for the double to single ionization and transfer-ionization to single capture ratios R_{DI} and R_{TI}, respectively. However, surprisingly in our data for R_{DC} the relative importance of these peaks maximize at a relatively small projectile energy of about 50 to 75 keV while in R_{DI} and R_{TI} the structures become increasingly pronounced with increasing projectile energy and are not observed below approximately 200 keV. We also found a pronounced peak structure in the double ratio R =R_{TE}/R_{DE}, where R_{TE} is the transfer excitation to single capture ratio and R_{DE} the double to single excitation ratio[1]. Our theoretical calculation qualitatively reproduces the peak structure in R if the elastic scattering between the projectile and the residual target ion is treated quantum-mechanically. Finally, we revisited doubly differential single ionization data reported earlier[2] and found peak structures in the ratios between cross sections for different electron energies. [1]W. Htwe et al., PRL 73, 1348 (1994) [2] T. Vajnai et al., PRL 74, 3588 (1995)

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