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Triply excited states formed in metastable ion-atom collisions[1] M. ZAMKOV, P. RICHARD, H. TAWARA, J.R. Macdonald Lab, Kansas State University, E.P. BENIS, T.J.M. ZOUROS, Univ. of Crete, Heraklion, Crete, Greece & J.R. Macdonald Lab, Kansas State University — We report the measurement of the absolute double differential cross section for the production of the triply excited $2s2p^2\ ^2D$ state of B^{2+} formed in $B^{3+}(1s2s\ ^3S) + H_2$ collisions. The states are formed by double excitation plus capture in two independent steps. In the first step, one k-vacancy was produced by stripping the initial $B^{2+}(1s^22s\ ^2S)$ beam to a $B^{3+}(1s2s\ ^3S)$ ion beam component in a carbon foil. The resulting fraction of $B^{3+}(1s2s\ ^3S)$ metastable ions has been determined. In the second step, the metastable beam collided with a hydrogen target to form the triply excited $2s2p^2\ ^2D$ by RTE from $B^{3+}(1s2s\ ^3S)$. The RTEA cross section has been measured for a wide range of projectile energies using zero degree Auger spectroscopy. Resonant behavior of the $1s2s\ ^3S$ to $2s2p^2\ ^2D$ transition has been observed and compared with theory.

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