Measurement of the Electron Affinity of Thallium by Photodetachment Threshold Spectroscopy

C.W. WALTER, N.D. GIBSON, G.R. DRUMM, Y. LI, S.M. MILLER, Denison University, Granville, OH — The electron affinity of thallium has been measured using tunable laser photodetachment threshold spectroscopy. The relative cross section for neutral atom production following photodetachment from Tl\(^-\) was measured with a crossed laser–ion beam apparatus over the photon energy range 0.30 – 0.50 eV. An s-wave threshold was observed due to the opening of the Tl\(^-\) \((6p^2\ ^3P_0)\) to Tl \((6p\ ^2P_{1/2})\) ground-state to ground-state transition, yielding a preliminary value for the electron affinity of thallium. The electron affinity measured in the present work is compared with previous experimental [1] and theoretical [2] results.


\(^1\)This material is based on work supported by the National Science Foundation under Grant Nos. 1404109 and 1707743.

C.W. Walter
Denison University, Granville, OH