

Abstract Submitted
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Precise Measurement of the Electron Affinity of Thallium using Laser Photodetachment Threshold Spectroscopy¹ C. W. WALTER, N. D. GIBSON, S. E. SPIELMAN, Denison University — The electron affinity of thallium has been precisely measured using laser photodetachment threshold spectroscopy. The relative photodetachment cross section from the negative ion Tl^- was measured using a narrowband tunable infrared laser over the photon energy range 300 – 900 meV (4130 – 1380 nm). A single s-wave threshold was observed in this range due to the $\text{Tl}^- (6p^2 \ ^3P_0)$ to $\text{Tl} (6p \ ^2P_{1/2})$ ground state-to-ground state transition, which determines the electron affinity of Tl. These results substantially improve the precision of the Tl electron affinity and resolve long-standing discrepancies in the literature between previous experimental and theoretical values.

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