

Abstract Submitted
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Measurement of the Electron Affinity of Arsenic and the Fine Structure of As^{-1} C.W. WALTER, N.D. GIBSON, R.L. FIELD III, J.Z. SHAPIRO, A.P. SNEDDEN, C.M. JANCZAK, Denison University, D. HANSTORP, Gothenburg University, Sweden — The electron affinity of arsenic and the negative ion fine structure splittings of As^{-} have been measured using tunable laser photodetachment threshold spectroscopy. The relative cross section for neutral atom production was measured with a crossed laser-ion beam apparatus over selected photon energy ranges between 0.63 – 0.82 eV. An *s*-wave threshold was observed due to the opening of the As^{-} ($4p^4 \ ^3P_2$) to As ($4p^3 \ ^4S_{3/2}$) ground state to ground state transition, yielding a preliminary value for the As electron affinity of 0.80481(13) eV. *s*-wave thresholds were also observed for detachment from the $J = 0$ and $J = 1$ excited levels of As^{-} , yielding preliminary values for the fine structure splittings of 0.1276(2) eV for $^3P_1 - ^3P_2$ and 0.1643(6) eV for $^3P_0 - ^3P_2$. The values measured in the present work are consistent with previous measurements [1,2] and substantially reduce the uncertainties. [1] T.P. Lippa *et al.*, J. Chem. Phys. **109**, 10727 (1998); [2] G. Haeffler *et al.*, Z. Phys. D **42**, 263 (1997).

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