Abstract Submitted
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Resonances in slow electron collisions with In, Tl, Ga and At atoms: Accurate electron affinities[1] ZINEB FELFLI, ALFRED Z. MSEZANE, Clark Atlanta University, DMITRI SOKOLOVSKI, Queen's University of Belfast, UK — The complex angular momentum (CAM)-calculated low-energy electron elastic total cross section (TCS) for In is benchmarked through its recently measured electron affinity (EA) [1]. The CAM method is then used to calculate the TCSs for Tl, Ga and At atoms. From the dramatically sharp resonances in the TCSs, binding energies (BEs) for Tl-, Ga- and At- formed during the collisions as Regge resonances are extracted and compared with the existing experimental and theoretical values. Notably, our calculated BE for the first excited state of Tl- agrees excellently with the EAs of [2, 3]. However, our EA for Tl is 2.415 eV. Consequently, we conclude that the published theoretical and experimental EAs for Tl correspond to the BE of the first excited state of Tl and not to the EA value. This calls for immediate experimental verification.

[1] C.W. Walter et al, Phys. Rev. A 82, 032507 (2010)
[2] F. Arnau et al, Chem. Phys. 166, 77 (1992)
[3] W. P. Wijesundera, Phys. Rev. A 55, 1785 (1997)

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