Target dependence of single electron capture cross sections for W^+ and W^{2+} ions

M. Imai, Y. Ohta, and A. Itoh

Department of Nuclear Engineering, Kyoto University, Kyoto, Japan

E-mail address of main author: imai@nucleng.kyoto-u.ac.jp

Single electron capture cross sections for W^+ and W^{2+} ions colliding with He, Ne, Ar, Kr, H_2, D_2, N_2, CH_4, C_2H_6, and C_3H_8 gas targets were derived experimentally in low energy region of 5.0 – 15 keV. The measured cross sections show clear dependence on the ionization potential (IP) of the targets. The observed IP dependence is, however, much far steeper than previously proposed IP scalings, $IP^{-2.76}$, $IP^{-2.0}$, and $IP^{-1.59}$, by Müller and Salzborn [1], Kusakabe *et al*. [2], and Yamada *et al*. [3], respectively, to reproduce electron capture cross sections for low-energy highly-charged ions. Other scaling properties concerning data evaluation for the present cross sections will be discussed as a case-study of estimating uncertainties of datasets being derived for the first time. Our compilation on electron capture and loss cross sections for heavy particle collisions will be introduced as well with data evaluation efforts based on the compilation.

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