

Abstract Submitted
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Double Photoionization of Magnesium from Threshold to 70 eV¹

RALF WEHLITZ, PAVLE JURANIĆ², Synchrotron Radiation Center, Univ. of Wisconsin-Madison, DRAGAN LUKIĆ, Institute of Physics, Belgrade, Serbia — We have determined the double-to-single photoionization ratio of magnesium from 22 to 70 eV photon energy using monochromatized synchrotron radiation and the ion time-of-flight method³. Our results compare reasonably well with recent theoretical calculations⁴ in the non-resonant energy region below 54 eV. Here, the photon energy dependence of the ratio can be modeled by a suitably scaled helium double-to-single photoionization ratio. However, to our surprise, a previously proposed scaling model for that ratio does not work in the case of Mg. From the near-threshold double-photoionization cross section we estimate the range of validity of the Wannier threshold law to be about 0.7 eV with a rather small cross section near threshold. At photon energies above 54 eV the ratio is strongly affected by $2p \rightarrow n\ell$ inner-shell excitations and rises sharply from a non-resonant value of about 1% below the $2p$ thresholds to about 1000% above thresholds⁵.

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