Abstract Submitted
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Electron excitation into the Xe($5p^5 7p$) configuration from the ground and $1s_5$ (J=2) metastable level[1] R.O. JUNG, JOHN B. BOFFARD, L.W. ANDERSON, CHUN C. LIN, University of Wisconsin-Madison — We have measured electron excitation cross sections into the $3p_x$ (Paschen's notation for $5p^5 7p$) levels of Xe by passing an electron beam through a static gas target (for ground state excitation) or an atomic beam emerging from a hollow cathode (for excitation from metastable levels) and detecting fluorescence from the decay of excited atoms. Excitation cross sections out of the ground level, especially at high energies, exhibit moderate dependence on gas pressure due to cascades from resonant levels. For excitation out of the $1s_5$ (J=2) metastables into the $3p_6$, $3p_7$, $3p_8$, and $3p_9$ levels (J=2,1,3,2), which conform to optical selection rules, the excitation functions demonstrate a variety of shapes ranging from an expected broad maximum to a sharp peak riding on a structure of intermediate width. The cross section data for the various $3p_x$ levels are interpreted in terms of oscillator strengths as well as angular momentum coupling of the states involved. The $3p_x \rightarrow 1s_y$ emissions are prominent components of Xe plasmas, making our measured cross sections valuable for optical plasma diagnostics.

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