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Positron-impact vibrational excitation cross sections and the Born dipole model[1] J.P. MARLER[2], C. M. SURKO, University of California, San Diego, G. F. GRIBAKIN, Queens University, Belfast — We describe *in situ* measurements of the positron- and electron-impact cross sections for vibrational excitation of the infrared-active (IR) ν_3 mode in CF_4 [1]. These cross sections are virtually identical and agree quantitatively with the predictions of the Born dipole model (BDM), which describes the effect of long range dipole coupling. We also compare the predictions of the BDM with the other positron-impact vibrational cross sections for IR modes measured to date (CO, CO_2, H_2, and CH_4) [2]. The BDM contributions to the measured cross sections vary widely. However, for all molecules except H_2 (for which the transition dipole moment is zero), the BDM model predicts the energy dependence of these cross sections quite well. The possible significance of these results will be discussed.

[1] J.P. Marler and C.M. Surko, *Phys. Rev. A.* **72**, 062702 (2005).
[2] J.P. Marler, G.F. Gribakin and C.M. Surko, *Nuclear Instrum. and Meth. B*, in press (2006).

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