

Abstract Submitted
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Toward a better understanding of resonant annihilation on molecules¹ C.M. SURKO, J.R. DANIELSON, A.C.L. JONES, University of California, San Diego — For many if not most molecules, annihilation at positron energies ϵ in the range of the vibrational modes proceeds via vibrational Feshbach resonances (VFR) in which positrons attach to these targets.^{2,3} In small molecules, the theory of Gribakin and Lee provides a quantitative description of the annihilation rates, Z_{eff} . However other effects are currently less well understood. Described here are some open questions and experiments using deuterium substitution that are designed to address them. They include the effect of intramolecular vibrational energy redistribution (IVR) on Z_{eff} in large molecules (e.g., alkanes), the role of molecular rotations on VFR in very small molecules (e.g., ammonia), and the observation of combination and overtone modes in molecules of small to intermediate size (e.g., acetylene and ethylene).

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²Gribakin and Lee, Phys. Rev. Lett. **97**, 193201 (2006).

³Gribakin, Young, and Surko, Rev. Mod. Phys. **82**, 2557 (2010).

James Danielson
UCSD

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