Abstract Submitted
for the DAMOP08 Meeting of
The American Physical Society

Resonant structures in the positron annihilation spectra of small molecules[1] C.M. SURKO, University of California, San Diego, J.A. YOUNG, University of Nevada, Las Vegas — Energy-resolved measurements of positron-molecule annihilation show that positrons can attach to molecules via vibrational Feshbach resonances (VFR) [1]. Furthermore, thanks to a recent theory by Gribakin and Lee, it is possible to quantitatively predict the positron-molecule annihilation spectra for small molecules in which all the vibrational modes are infrared-active [2]. In this paper, we examine the annihilation spectra for a variety of small molecules and relate them to this theory. We find that fundamental-mode *and* multi-mode VFR are necessary to explain the spectra of molecules such as methanol. We also present results for molecules such as water and CO_2 that do not have clearly identifiable VFR but appear to have structure to their spectra.
[1] L. D. Barnes, J. A. Young, and C. M. Surko, *Phys. Rev. A* **74**, 012706 (2006).
[2] G. F. Gribakin and C. M. R. Lee, *Phys. Rev. Lett.* **97**, 193201 (2006).

[1]This work is supported by NSF, grant PHY 02-44653.

J.A. Young
University of Nevada, Las Vegas

Date submitted: 02 Feb 2008 Electronic form version 1.4