

Abstract Submitted  
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**Chemical trends in positron binding to acetates, formates, aldehydes and ketones.**<sup>1</sup> A.C.L. JONES, J.R. DANIELSON, C.M. SURKO, University of California, San Diego — Positron annihilation on molecules as a function of incident positron energy exhibits vibrational Feshbach resonances (VFR).<sup>2</sup> The energy shifts between the vibrational modes and the VFR provide a measure of the positron-molecule binding energy,  $\epsilon_b$ . Measurements of  $\epsilon_b$  for over 40 molecules have now been made. A previous analysis expressed the dependence of  $\epsilon_b$  on molecular parameters as  $\epsilon_b \approx 12.4(\alpha + 1.6\mu - 5.6)$  [meV], where  $\alpha$  is the molecular polarizability and  $\mu$  is the permanent dipole moment.<sup>3</sup> Measurements for molecules with large  $\mu$  show enhancements beyond the predictions using the formula.<sup>4</sup> New measurements on acetates, formates, aldehydes, and ketones, will be presented. An analysis of these chemical trends will be discussed that illustrates the importance of molecule geometry and the location of  $\mu$  and the methyl groups in influencing the size of  $\epsilon_b$ .

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<sup>2</sup>Gribakin, Young, and Surko, Rev. Mod. Phys. **82**, 2557 (2010).

<sup>3</sup>Danielson, Young, and Surko, J. Phys. B **42**, 235203 (2009).

<sup>4</sup>Danielson, Gosselin, and Surko, Phys. Rev. Lett., **104**, 233201 (2010).

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