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Spectroscopic Determination of Optimal Pathways for Vibrational Transfer in Ultracold KRb Molecules J.T. KIM, Department of Photonic Engineering, Chosun University, Gwangju 501-759, Korea, Y. LEE, Department of Chemistry, Mokpo National University, Jeonnam 534-729, Korea, B. KIM, Department of Chemistry, KAIST, Daejeon 305-701, Korea, D. WANG, Department of Physics,The Chinese University of Hong Kong, Shatin, Hong Kong, W.C. STWALLEY, P.L. GOULD, E.E. EYLER, Department of Physics, University of Connecticut, Storrs, CT 06269-3046, USA — Many applications of ultracold polar molecules (quantum degeneracy, quantum information, and novel quantum phases) require molecules in their lowest rovibronic level. Formation of these molecules by photoassociation or magnetoassociation typically results in highly rovibronically excited molecules near dissociation. Stimulated Raman transfer is a promising method of converting these highly rovibronically excited molecules into the lowest rovibronic level, i.e. the v"=0, J"=0 level of the $X\ \ ^1\Sigma^+$ ground electronic state. We show that a multiplicative combination of supersonic molecular beam spectra and ultracold polar molecule spectra can be used to determine the optimal pathways for Raman transfer for the specific example of KRb, even when spectral assignments are unavailable. Support from National Research Foundation of Korea, NSF and AFOSR is gracefully acknowledged.

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