Vibrational Energy Transfer of I_2(X, v=23 and v=43) in a Helium Free Jet Expansion

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Collision induced vibrational energy transfer of highly excited I_2(X) was studied in a helium free jet expansion at about 5K. Stimulated emission pumping was used to prepare a specified vibrational state. Laser induced fluorescence of the D-X transition was then used to probe the initial and the collisionally populated states. Two vibrational levels (v=23, v=42) of I_2(X) were examined in this study. Preliminary analysis suggests a weak vibrational dependance of the relaxation rate constants as well as a near temperature independent cross section when compared to room temperature data. These findings are in disagreement with the predictions of the Landau-Teller model. A more detailed analysis will be performed and the results presented.
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