CROSSED BEAM INELASTIC SCATTERING FROM S_1 GLYOXAL COLLISIONS WITH THE RARE GASES.

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State-to-state vibrational energy transfer (VET) from S_1 glyoxal (CHO-CHO) collisions with the rare gases has been studied with a crossed molecular beam and laser pump-dispersed fluorescence probe approach. A laser is used to pump glyoxal to the 0^0, $0 \geq J' \geq 10$, $K' = 0$ level of the S_1 (^1A_u) state. Emission from K state resolved rotational states excited by inelastic collisions is monitored by dispersed fluorescence. VET competition between rotational energy transfer and rovibrational energy transfer to the lowest frequency torsional mode, ν_7, becomes particularly interesting where equal amounts of energy can be exchanged. The completion of the set of rare gases demonstrates the effect the collision energy has on the extent of rotational excitation. These results can also be used to further establish benchmarks for the 3-dimensional quantal scattering model that has so successfully been used with past glyoxal energy transfer.[1]

1. G.-J. Kroes, R.P.H. Rettschnick, and D.C. Clary, Chem. Phys. 148, 359 (1990)