STUDY ON IVR OF THE N-H STRETCHING VIBRATION OF ANILINE BY PICOSECOND IR-UV PUMP-PROBE SPECTROSCOPY IN A SUPERSONIC BEAM

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The intramolecular vibrational energy redistribution (IVR) of the NH stretching vibration of aniline at 3450 cm^{-1} has been investigated by time-resolved picosecond IR-UV pump-probe spectroscopy in a supersonic beam. The population decay of the NH stretching vibration prepared by a picosecond IR pulse and the rise of the IVR redistributed vibrational levels were observed by 1+1 REMPI with a picosecond UV laser pulse. Both the symmetric and asymmetric vibrations were investigated; the IVR lifetime of the symmetric NH was 18 ps, while that of asymmetirc NH was estimated to be 34 ps. Deuterium substitution of all the CH groups of phenyl ring, that is aniline-d_5, lengthened the IVR lifetime of the symmetric NH by a factor of 1.7, while the asymmetric NH stretch showed very small change. The energy flow mechanics on the based on the tier-model will be compared with that of the OH stretching vibration of phenol.