

## INFRARED DEPLETION SPECTROSCOPY OF THE ANILINE-WATER-TOLUENE CLUSTER CATION AND MODE SELECTIVE PREDISSOCIATION OF THE HYDROGEN BONDS.

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The vibrational spectrum of the ternary cluster cation of aniline-water-toluene in a supersonic jet has been measured by infrared depletion method in the NH and OH stretching region. Three bands were observed at 3722, 3634 and 3295 $\text{cm}^{-1}$ . The analysis of the vibrational spectrum showed that two NH bonds of aniline interact with water and toluene in the cluster cation. The band at 3295 $\text{cm}^{-1}$  was assigned to the stretching vibration of NH of aniline cation interacting with toluene, whereas other two bands were assigned to the symmetric and anti-symmetric stretching vibrations of free OH of water.

When the cluster absorbs the infrared photon, it dissociated into two fragments. There are two possible dissociation path of this cluster.

1)  $\text{AWT}^+ \rightarrow \text{AW}^+ + \text{T}$  and 2)  $\text{AWT}^+ \rightarrow \text{AT}^+ + \text{W}$

The branching ratio of this reaction  $\text{AW}^+/\text{AT}^+$  was measured for three different bands, and we obtained 0.49 for the NH stretching vibration and 0.37 and 0.38 for the OH stretching vibrations. This results suggest that there is a fast energy transfer from the NH stretching vibration to the hydrogen bond between NH and toluene which enables the vibrational mode dependence of the predissociation.