VIBRATIONAL PREDISSOCIATION OF $Na^+(CH_3OH)_m$ (m=2-7) FROM 2.5 TO 3.0 MICRONS.

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The vibrational predissociation spectra of $Na^+(CH_3OH)_m$ (m=2-7) clusters were recorded in the frequency range of 2.5 to 3.0 μm, corresponding to the stretch of the O-H functional group in methanol. Hydrogen bonding between two methanols , as in the case of the gas phase dimer, results in two inequivalent methanols, a proton donor and acceptor. The oscillator strength and the frequency of the proton donating methanol are strongly perturbed by the hydrogen bond. Vibrational predissociation induced through excitation of the O-H group can be used to observe the presence of hydrogen bonding. Transitions were observed around 3670 cm^{-1} for all of the cluster ions studied. This feature is attributed to methanols with the O-H groups that are not acting as proton donors in a hydrogen bond. For clusters of size $m \geq 5$, absorption features were observed below 3500 cm^{-1} which correspond to methanols with proton-donating O-H groups. The spectra will be discussed along with structural implications. For comparison, data from $Cs^+(CH_3OH)_p$ cluster ions will also be briefly presented.