INFRARED SPECTROSCOPIC INVESTIGATION ON HIGH ACIDITY OF DIETHYLETHER CATION

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We performed infrared spectroscopy of a diethylether cation which was generated by the vacuum-ultraviolet photoionization. In the observed spectrum, the stretch vibration of the CH bond next to the oxygen atom appears with high intensity in the lower frequency region than ordinary alkyl CH stretches. Comparison of infrared spectroscopic results and theoretical calculations reveals that the low frequency of the CH stretch originates from hyperconjugation between the CH bonding orbital and the nonbonding orbital of the oxygen atom. This hyperconjugation also induces the increase of the acidity of the CH bond as well as its stretch band intensity.