INFRARED PHOTODISSOCATION SPECTROSCOPY OF ALUMINUM BENZENE CATION COMPLEXES

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$\mathrm{Al}^+ - \mathrm{bz}$ and $\mathrm{Al}^+ - \mathrm{bz}_2$ complexes are produced in a laser vaporization/supersonic expansion source. These complexes are mass selected and their infrared spectra (700-4500 cm^{-1}) are taken using infrared laser photodissociation spectroscopy via the argon tagging method. DFT on both complexes is carried out to obtain the structures and vibrational frequencies. The CH stretch and fingerprint regions of both complexes are compared to theory and the free benzene spectrum. The far infrared spectrum of $\mathrm{Al}^+ - \mathrm{bz}$ (700-1800 cm^{-1}) is compared to the previous spectrum collected using IR-MPD and significant differences in linewidth and line position are observed. The structure of $\mathrm{Al}^+ - \mathrm{bz}_2$ indicated by the vibrational band patterns is investigated and compared to theory, which predicts an asymmetric structure.