INFRARED RESONANCE ENHANCED PHOTODISSOCIATION SPECTROSCOPY OF $Si^+(CO_2)_n$, $Si^+(CO_2)_nAr$, AND $Si^+(O_2)(CO_2)_n$ CLUSTERS

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Weakly bound $Si^+(CO_2)_n$, $Si^+(CO_2)_nAr$, and $Si^+(O_2)(CO_2)_n$ complexes are produced by laser vaporization in a pulsed supersonic expansion. The ions are then mass selected in a reflectron time-of-flight mass spectrometer where they are photodissociated by a tunable infrared OPO/OPA laser system near the asymmetric stretch (ν_3) of CO_2. Dissociation is more efficient on resonance, thus monitoring the fragmentation channel as a function of infrared laser frequency produces the IR absorption spectrum for the complex of interest. $Si^+(CO_2)_n$ and $Si^+(O_2)(CO_2)_n$ clusters fragment by the loss of whole CO_2 units while $Si^+(CO_2)_nAr$ complexes fragment by the loss of argon. Interpretation of the observed infrared spectra will be discussed.