

INFRARED RESONANCE ENHANCED PHOTODISSOCIATION SPECTROSCOPY OF $\text{Si}^+(\text{CO}_2)_n$, $\text{Si}^+(\text{CO}_2)_n\text{Ar}$, AND $\text{Si}^+(\text{O}_2)(\text{CO}_2)_n$ CLUSTERS

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Weakly bound $\text{Si}^+(\text{CO}_2)_n$, $\text{Si}^+(\text{CO}_2)_n\text{Ar}$, and $\text{Si}^+(\text{O}_2)(\text{CO}_2)_n$ 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. $\text{Si}^+(\text{CO}_2)_n$ and $\text{Si}^+(\text{O}_2)(\text{CO}_2)_n$ clusters fragment by the loss of whole CO_2 units while $\text{Si}^+(\text{CO}_2)_n\text{Ar}$ complexes fragment by the loss of argon. Interpretation of the observed infrared spectra will be discussed.