

## ISOMER-SPECIFIC INFRARED SPECTROSCOPY OF IONIC COMPLEXES

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We report a new technique which allows for isomer-specific infrared spectroscopy of gas-phase ionic species. In this two-laser, tandem time-of-flight method, we monitor the ground-state population of a specific isomer by tuning an infrared laser to one of its vibrational transitions and measuring the resulting predissociation yield. This population is depleted when another, preceding infrared laser scans through the vibrational resonances of that isomer, thus isolating its infrared spectrum. We demonstrate the generality of this predissociation-dip method by applying it to several ionic systems, including anionic  $\text{Cl}^- \cdot \text{HDO} \cdot \text{Ar}$  and cationic  $\text{Aniline} \cdot \text{H}^+ \cdot \text{Ar}$ . In the hydrated chloride study, we separate the infrared spectrum of  $\text{Cl}^- \cdot \text{HOD}$  (where the H is shared between the  $\text{Cl}^-$  and O) from that of  $\text{Cl}^- \cdot \text{DOH}$ , and empirically assign a band near  $3000 \text{ cm}^{-1}$  to the  $\text{Cl}^- \cdot \text{HOD}$  isomer. We will also discuss the utility of this technique in the context of recent experimental studies of large proton-bound dimers.