VIBRATIONAL SPECTRA OF CRYOGENIC PEPTIDE IONS USING H_2 PREDISSOCIATION SPECTROSCOPY

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H_2 predissociation spectroscopy was used to collect the vibrational spectra of the model protonated peptides, GlyGly, GlySar, SarGly and SarSar (Gly=glycine and Sar=sarcosine). H_2 molecules were condensed onto protonated peptide ions in a quadrupole ion trap cooled to approximately 10 K. The resulting spectra yielded clearly resolved vibrational transitions throughout the mid IR region, 600-4200 cm^{-1}, with linewidths of approximately 6 cm^{-1}. Protonation nominally occurred on the amino terminus giving rise to an intramolecular H-bond between the protonated amine and the neighboring amide oxygen. The sarcosine containing peptides incorporate a methyl group onto either the amino group or the amide nitrogen causing the peptide backbone to adopt a different structure, resulting in the shifts in the amide I and II bands and the N-H stretches.