

ULTRAVIOLET SPECTROSCOPY OF SUPERCRITICAL CARBON DIOXIDE

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Vacuum ultraviolet spectroscopy was used to explore the density dependence of supercritical carbon dioxide electronic absorption spectra over the wavelength range 145.5-200 nm at 34.5 °C. Pressure was varied from 19 to 137 bar, giving a corresponding density range of 0.036-0.767 g cm⁻³. The vibronic structure inherent to the spectrum is apparent at the lowest densities, but gradually diminishes in magnitude with increasing density. At a density of 0.595 g cm⁻³ the structure is no longer apparent. This loss of detail cannot be explained by collisional broadening or dimerization, and we suggest gradual perturbation of the monomer electronic and vibrational structure with increasing density, similar to that observed in recent studies of supercritical water.