PHASE SHIFT CAVITY RING DOWN (PS-CRD) SPECTROSCOPY AT CRYOGENIC TEMPERATURES.

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Phase Shift Cavity Ring Down (PS-CRD) spectroscopy was used for the detection of high vibrational overtones in a low temperature environment. The PS-CRD technique at low temperature involves an optical cavity (static cell) attached to a cryostat. The cell and mirrors of the optical cavity are at the same temperature. A continuous wave titanium sapphire laser system in the wavelength range from 700 to 820nm and with a 0.1 cm^{-1} resolution was electro-optically modulated, and passed through the optical cavity. The change in the phase angle of the modulated laser beam after passing through the cavity was recorded as a function of the wavelength. The tangent of the phase shift angle is related to the light relaxation time. The rotationally resolved C-H overtone $(v = 0 \rightarrow 5)$ of CHD_3 was then studied over the temperature range 296K to 100K.