CAVITY RING-DOWN SPECTROSCOPY IN LIQUID PHASE

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A new application for cavity ring-down spectroscopic (CRDS) technique using a pulsed polarized light source has been developed in the absorption measurement of liquids for ”colorless” organic compounds using both a single sample cell and double sample cells inserted in optical cavity at Brewster angle. At present an experimental capability of measuring absorption coefficients as small as 2-5e10-7 cm-1 has been demonstrated by measurement of the absorption baselines. The C-H stretching 5th vibrational overtones of benzene in pure liquid and hexane solution are measured using CRDS. The optical absorption length for liquids in both a single sample cell and double sample cells of 1 cm length is up to 900 cm due to multipass of light within a optical cavity. Comparing the thermal lens and optoacoustic spectroscopic techniques, the sensitivity for CRDS is not limited by the laser power and the length of sample cell. The absolute absorption coefficient and band intensity for sample are determined directly by the spectroscopy.