

TRANSIENT FREQUENCY ABSORPTION STUDIES OF MOLECULES PRODUCED IN A LASER ABLATION - SUPERSONIC EXPANSION SOURCE

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The supersonic free jet expansion of a laser ablation/reaction source has been coupled to sensitive transient frequency modulation absorption spectroscopy^{1,2} for the first time. The (0,0) $A^1\Sigma - X^1\Sigma$ band system ($\nu = 12643 \text{ cm}^{-1}$) of PtC and the (0,0) $C^3\Delta - D^3\Delta$ band system of TiS ($\nu = 12065 \text{ cm}^{-1}$) were recorded. Excellent S/N could be achieved using a single pass through the expansion 5 cm from the ablation source. Narrow spectral features (< 200 MHz) were achieved by appropriate temporal gating of the transient signal. The observed absorption lineshapes exhibit a dependence on the intrinsic transition moment and therefore the probe laser power, which facilitated the assignment of the optical spectrum.

¹ J.C. Bloch, R.W. Field, G.E. Hall and T.J. Sears, *J. Chem. Phys.* 101, 1717 (1994).

² A.J. Marr, T.J. Sears, B-C Chang, *J. Chem. Phys.* 109, 3431 (1998).

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