HIGH RESOLUTION INFRARED SPECTROSCOPY OF CH_2D

MELANIE A. ROBERTS, CHANDRA SAVAGE, DAVID J. NESBITT, *JILA, National Institute of Standards and Technology and University of Colorado, Boulder, CO 80309*.

Monodeuterated methyl radical is a simple organic radical with applications in investigations of combustion chemistry. CH_2D is readily synthesized via DC discharge of CH_2DI coupled to a slit-jet supersonic expansion, enabling the first high-resolution spectroscopic study of this molecule. In the present work, multiple transitions of both the symmetric and asymmetric CH stretches of CH_2D were measured. Fine and hyperfine structure, arising from interactions between the unpaired electron, both hydrogens (I = 1/2), and the deuteron (I = 1), were resolved in several transitions. These complex line profiles were fit using a least-squares analysis to a Watson A-reduced asymmetric top Hamiltonian to obtain rotational, fine, and hyperfine constants.