

## SEPARATION AND CONVERSION OF NUCLEAR SPIN ISOMERS OF ETHYLENE

Z.-D. SUN, *Department of Physics, Toyama University, 930-8555, Japan; Department of Physics, Yantai University, 264005, P. R. China*; K. TAKAGI, S. YAMADA, H. TANAKA, and F. MATSUSHIMA, *Department of Physics, Toyama University, 930-8555, Japan*.

The separation and conversion of nuclear spin isomers with  $A_g$ ,  $B_{1g}$ ,  $B_{2u}$ , and  $B_{3u}$  symmetry of normal ethylene ( $C_2H_4$ ) have been investigated by a newly assembled experimental setup in the first case studied so far for a planar, asymmetric-top polyatomic molecule that has four nuclear spin isomers with the  $D_{2h}$  symmetry group. One of the nuclear spin isomers of  $C_2H_4$  is first separated using the 10P44  $CO_2$  laser line in the method of Light-Induced Drift<sup>a</sup>. The equilibration decay curves of the spin isomers are then measured using a second probe  $CO_2$  laser to monitor absorption spectral line intensities as a function of time. The conversion rates between isomers have been determined by fitting these decay curves to an exponential function. The experimental results and their interpretations will be presented.

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<sup>a</sup>F.Kh. Gel'mukhanov, and A.M. shalagin, JETP Lett. **29**, 711 (1979).