EXCITED STATE ISOMERIZATION OF A STILBENE ANALOG: E / Z PHENYLVINYLACETYLENE

JOSH J. NEWBY, CHRISTIAN W. MÜLLER, CHING-PING LIU [a], HSIUPU D. LEE AND TIMOTHY S. ZWIER, *Department of Chemistry, Purdue University, West Lafayette, IN 47907*.

The excited state isomerization of the E and Z forms of phenylvinylacetylene (PVA, 1-phenyl-1-buten-3-yne) has been studied using ultraviolet population transfer spectroscopy (UVPT). UVPT is a pump-probe experiment, where single isomers are selectively excited and after a wait time, the induced change in population of reactant and product isomers is probed. In these experiments, after initial cooling, an isomer of PVA is selectively excited to vibrational levels in the S_1 electronic state. If the energy supplied by the excitation is above the barrier to isomerization population can be transferred into a product well. Excited molecules are collisionally cooled via supersonic expansion and a new population distribution can be detected downstream via R2PI spectroscopy. From these experiments, product isomerization quantum yields have been determined for both E to Z and Z to E excited state pathways as a function of excess energy above the S_1 origin.

[a]Current Address: Institute of Chemistry, Academia Sinica, Taipei, 11529 Taiwan.