

CONICAL INTERSECTION DYNAMICS IN CYCLOPENTADIENE^a

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Photochemical reactions of cyclic organic molecules are commonly used in many biological systems, solar energy resources, synthetic materials, and pharmaceuticals. Though energetically unfavored, highly strained ring structures produced from photolysis are of particular interest because their reaction mechanisms, once fully understood, could be leveraged for synthetic methods. In particular, we are interested in studying cyclopentadiene (CP), a small organic molecule whose photochemical pathway involves an electrocyclic process to form highly strained ring products upon UV excitation. We performed ultrafast time-resolved, gas-phase X-ray scattering experiments on cyclopentadiene at the CXI endstation of LCLS to explore the structural dynamics as the reaction evolves through a set of conical intersections.

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