

STRUCTURE AND DYNAMICS OF THE CYCLOPROPENE RADICAL CATION STUDIED BY HIGH-RESOLUTION PHOTOELECTRON SPECTROSCOPY

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High-resolution photoelectron spectra of cyclopropene (c-C<sub>3</sub>H<sub>4</sub>) and several of its deuterated isotopomers have been recorded. From the analysis of the almost fully resolved rotational structure of the origin of the  $\tilde{X}^+ 2B_2 \leftarrow \tilde{X}^1 A_1$  ionizing transition of c-C<sub>3</sub>H<sub>4</sub>, c-C<sub>3</sub>H<sub>3</sub>D, c-C<sub>3</sub>H<sub>2</sub>D<sub>2</sub>, c-C<sub>3</sub>HD<sub>3</sub> and c-C<sub>3</sub>D<sub>4</sub> and the observation of several low-lying vibrational levels of the corresponding cations, we conclude that the cyclopropene cation has an equilibrium structure deviating from  $C_{2v}$  symmetry. We believe that the cation is subject to a large-amplitude tunnelling motion along a mode of a<sub>2</sub> symmetry involving a twist of the CH<sub>2</sub> group and an asymmetric out-of-plane bending of the CH units. The reasons for this belief and also currently unresolved aspects of our analysis will be discussed.