Neutral Homoaromatic Hydrocarbons – a New Model Platform for Molecular Photoswitches

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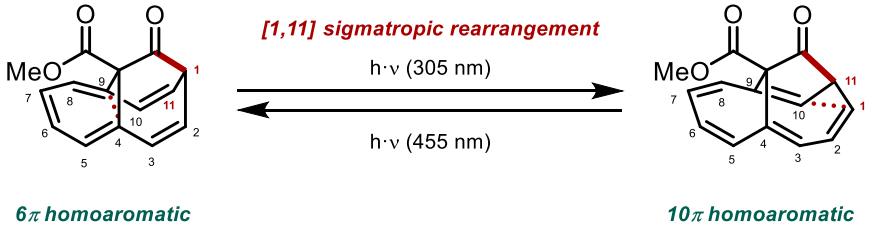
The identification and characterization of homoaromatic compounds bearing an interrupted π-system are fundamental challenges for the understanding of electronic interactions in organic molecules.[1] This is further hampered by the fact that no stable neutral homoaromatic hydrocarbon is known. We present the preparation of a new class of neutral and stable homoaromatic compounds,[2] which is supported by experimental evidence (ring current observed by NMR spectroscopy, equalization of bond lengths through X-ray structure analysis) as well as computational analysis (NICS[3] and ACID[4]).

Furthermore, we can show that one homoaromatic hydrocarbon of this class acts as a photoswitch through a reversible photochemical [1,11] sigmatropic rearrangement.[2] To the best of our knowledge, such a process involving the 10π homoaromatic system has not been reported earlier. These results of stable and accessible homoaromatic neutral hydrocarbons and their photoswitching behaviour provide new insights for the understanding and study of homoconjugative interactions in organic molecules, and for the design of new responsive molecular materials.



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