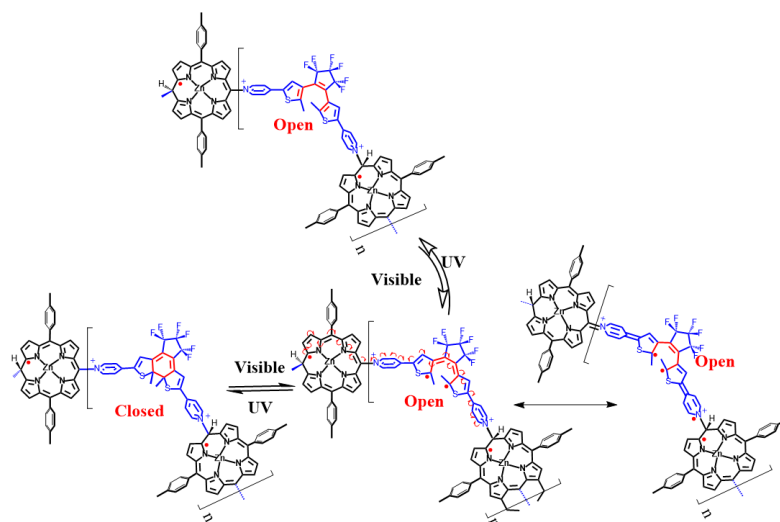


# Uncovering the Photoswitchable Nature of Diarylethene (Iso)Porphyrin Copolymers: Synthesis, Characterization, and Photochromism

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The diarylethene (DAE) class is one of the most intensely studied type of photochromatic dye which attract great attention from researchers seeking to exploit light responsive switches in an extensive diversity of fields. DAE is the subject of many avenues of research. Recently, we have reported the synthesis of a diarylethene-porphyrin copolymer via the electropolymerization of zinc octaethyl porphyrin and pyridine substituted diarylethene.<sup>1</sup> Herein, we report the synthesis of a series of new diarylethene isoporphyrin photoswitchable copolymers obtained via oxidation of the 5,15-ditolylporphyrin of zinc (ZnT<sub>2</sub>P) in the presence of pyridine-substituted diarylethene (DAE). The copolymerization process was monitored using an electrochemical quartz crystal microbalance (EQCM). The resulting copolymers were also characterized using electrochemistry, UV-Vis-NIR spectroscopy, X-ray photoelectron spectroscopy (XPS), and atomic force microscopy (AFM). The copolymers were found to be switchable between ring-opening and closing states using visible light. The effect of the polymer environment on DAE photochromism was also investigated. Attention is focused on the ways the copolymer environment affects DAE photochromism. Overall, this work expands our understanding of the synthesis and characterization of porphyrin photoswitchable copolymers and their potential applications.



**Figure:** Scheme of Open to Closed interconversion of DTE(Py)<sub>2</sub>-ZnT<sub>2</sub>isoP Copolymer.

## REFERENCE

1. Huo, Z.; Badets, V.; Farha, R.; Goldmann, M.; Xu, H.; Yi, T.; Ruhlmann, L. "Synthesis and characterization of bisthiénylene-porphyrin photoswitchable copolymers", *Eur. J. Org. Chem.* **2021**, *48*, 6636-6645.