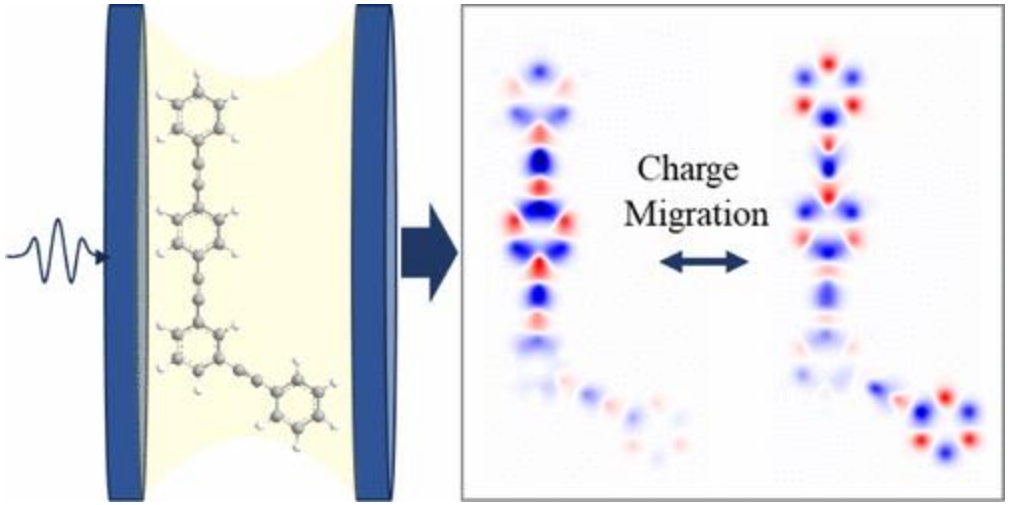
Cavity Manipulation of Attosecond Charge Migration

Scientific Achievement

Our theoretical modeling demonstrates that attosecond charge migration in molecular systems can be attained with strong-light matter interactions in apolatitonic cavity. Coherent X-ray sources can sensitively monitor the emerging dynamics.



The picture illustrates attosecond charge migration in molecules that can be controlled by strong light-matter interactions in the cavity and monitored with X-ray light sources

Significance and Impact

Controlling photophysical and photochemical processes in molecules can be achieved in polaritonic cavity. This process can be probed at the national X-ray facilities.

Research Details

- Developed computational framework for simulating attosecond charge migration in molecules
- Validated by applying to two molecular systems and linked to potential experiments

Zhang, B.; Gu, Y.; Freixas, V. M.; Sun, S.; Tretiak, S.; Jiang, J.; Mukamel, S. Cavity Manipulation of Attosecond Charge Migration in Conjugated Dendrimers. *Journal of the American Chemical Society* 2024, *146* (39), 26743–26750. DOI:10.1021/jacs.4c06727.

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