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# Synthesis of *trans*-porphyrin dimers for nonlinear optics

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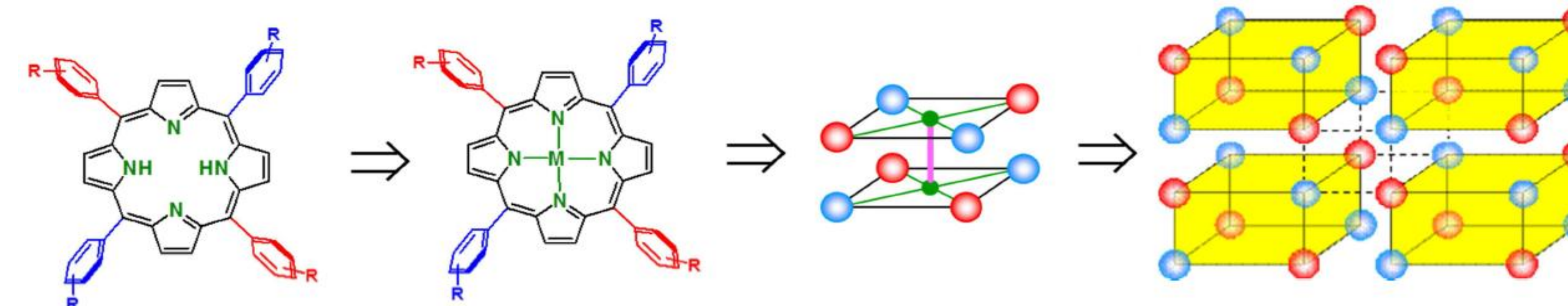
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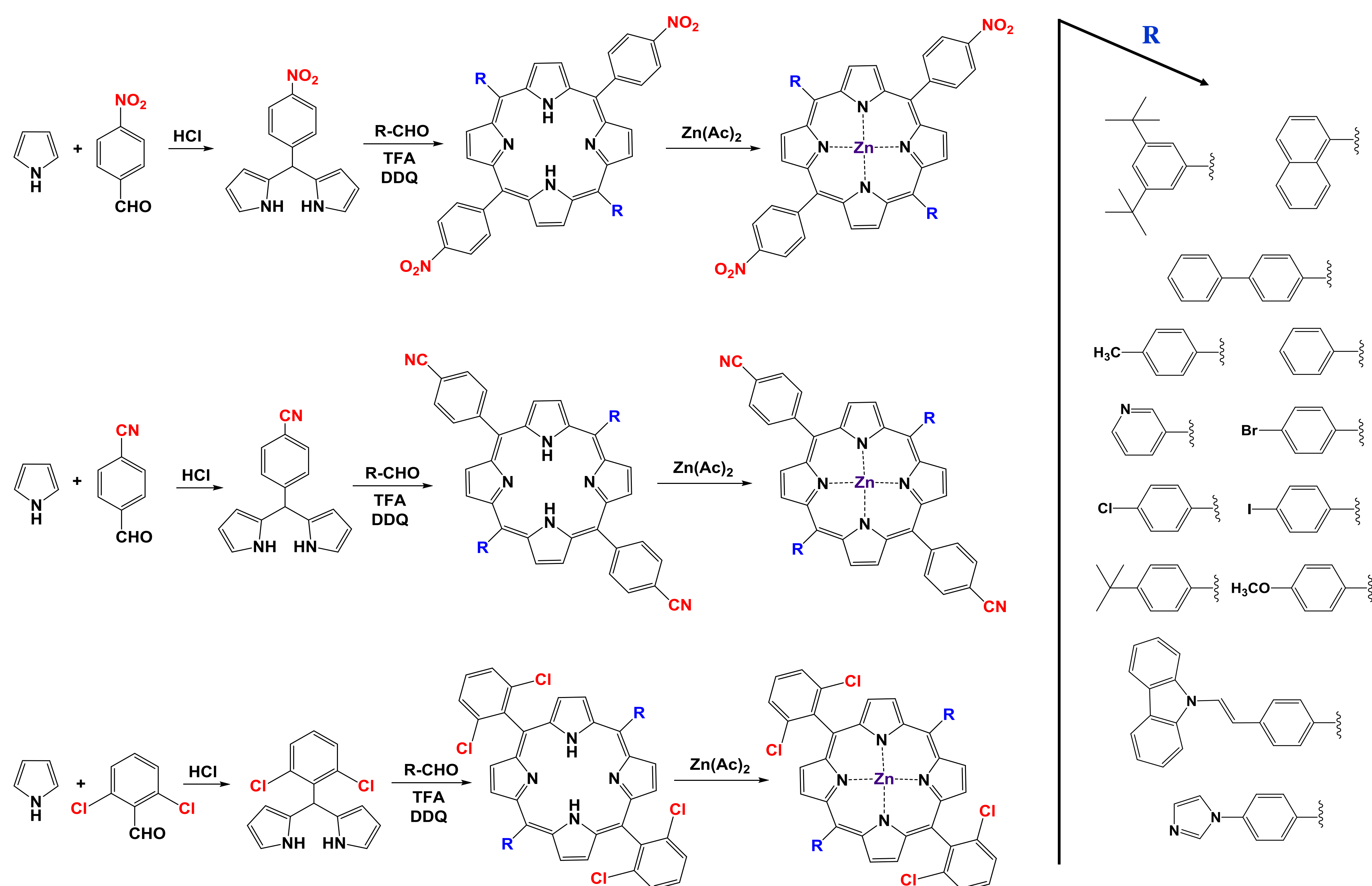
## Abstract

Following the development of the idea of octupolar molecules as nonlinear optical materials a variety of compounds have been reported. *Trans*-porphyrins have a great potential to self-order into octupolar symmetry. Nonlinear optical properties can be tuned by using strong donor-acceptor groups in porphyrins as well as extension of conjugation. Here we report the syntheses of *trans*-A<sub>2</sub>D<sub>2</sub>-porphyrins and their dimerization into cubic octupoles by lanthanides and organic bidentate ligands. Bulky groups are employed to induce non-centrosymmetric eclipsed or staggered conformations. Effect of donor-acceptor groups, dimerization conditions and crystal packing of dimers are studied.

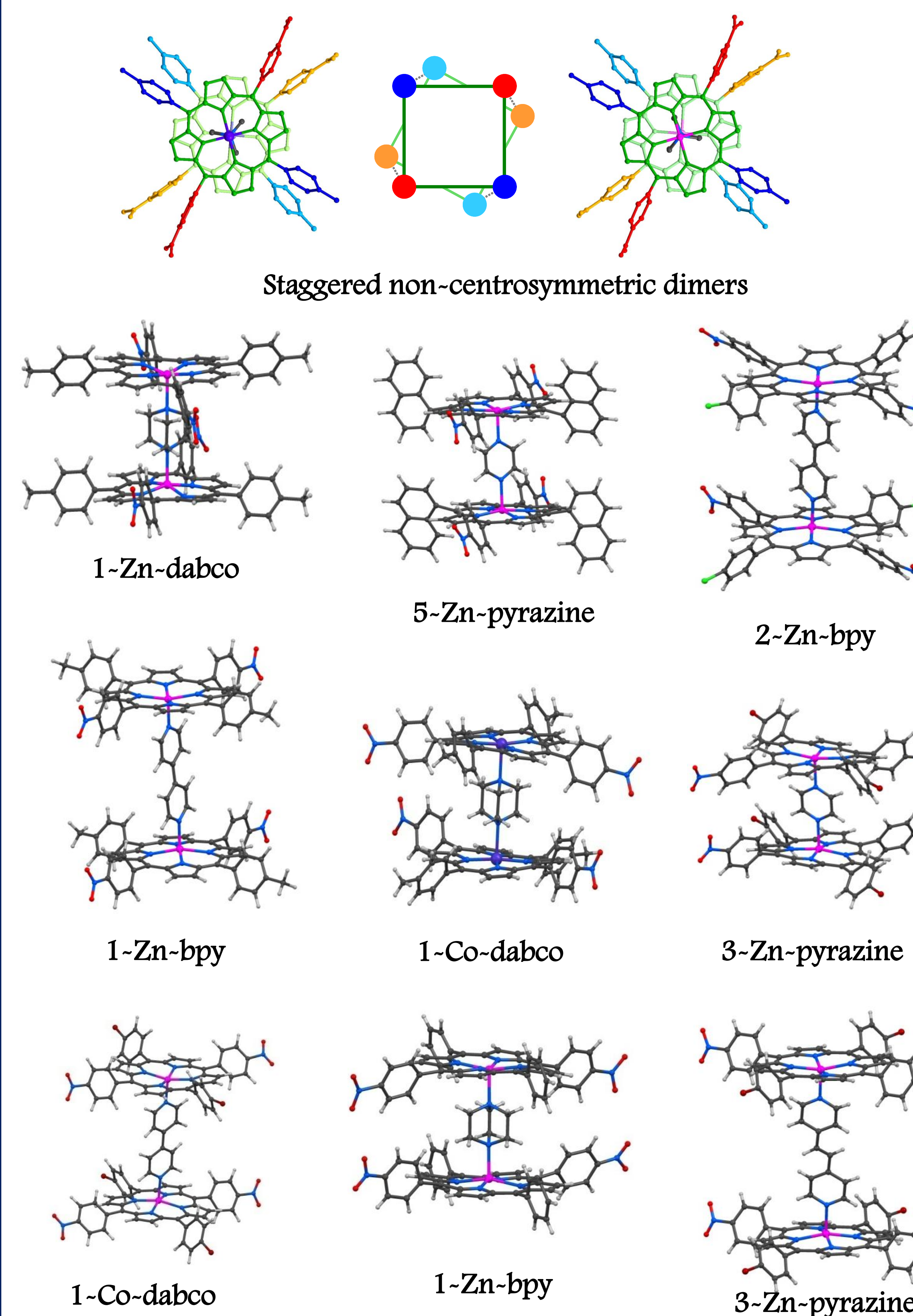
## Dimerization of *trans*-porphyrins



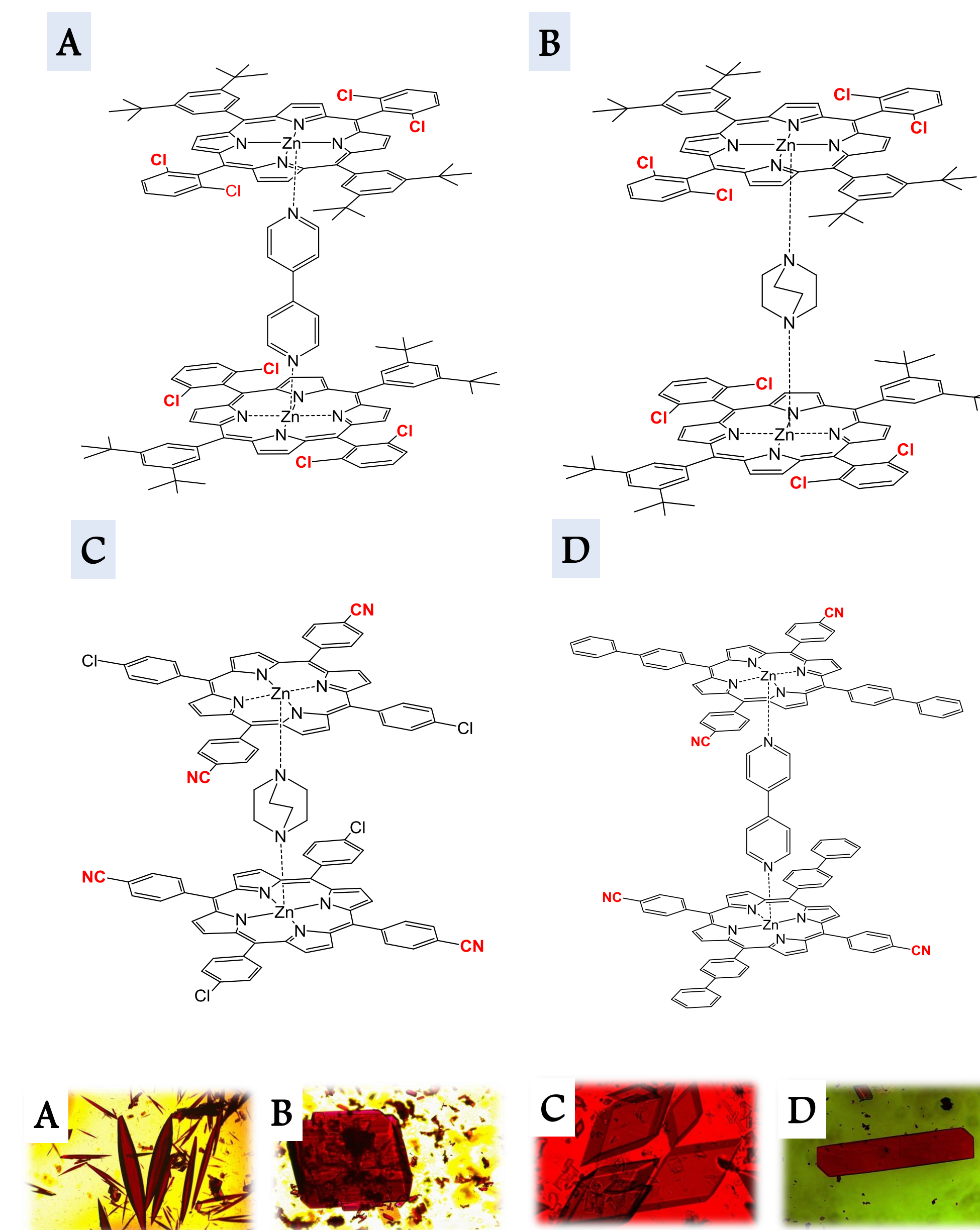
## Synthesis of *trans*-porphyrins



## Crystal Structure of Dimers

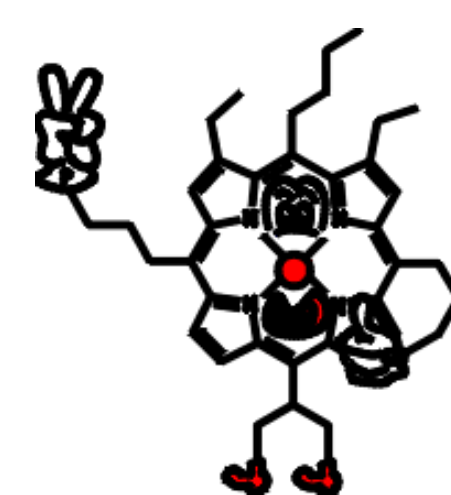


## Dimerization with Bidentate Ligands



## Summary

- Synthesized various *trans*-A<sub>2</sub>D<sub>2</sub> porphyrins and metallo-porphyrins.
- Obtained new dimers with different bidentate ligands.
- The crystal structures of newly obtained dimers are being analyzed.



## Acknowledgements

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