

Synthesis of Tetraphenylene Bridged Tetraazapentacene Dimer

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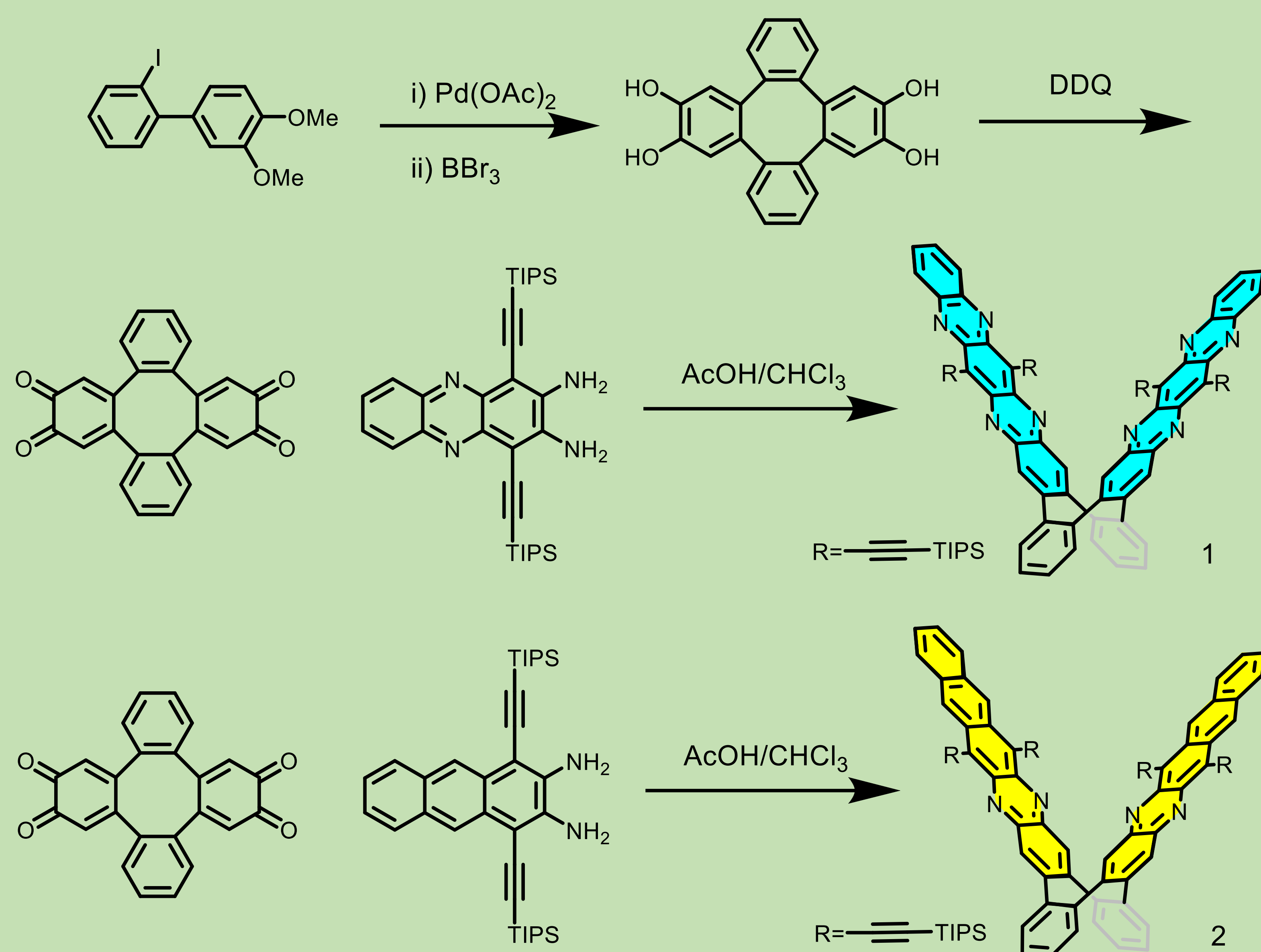


Introduction

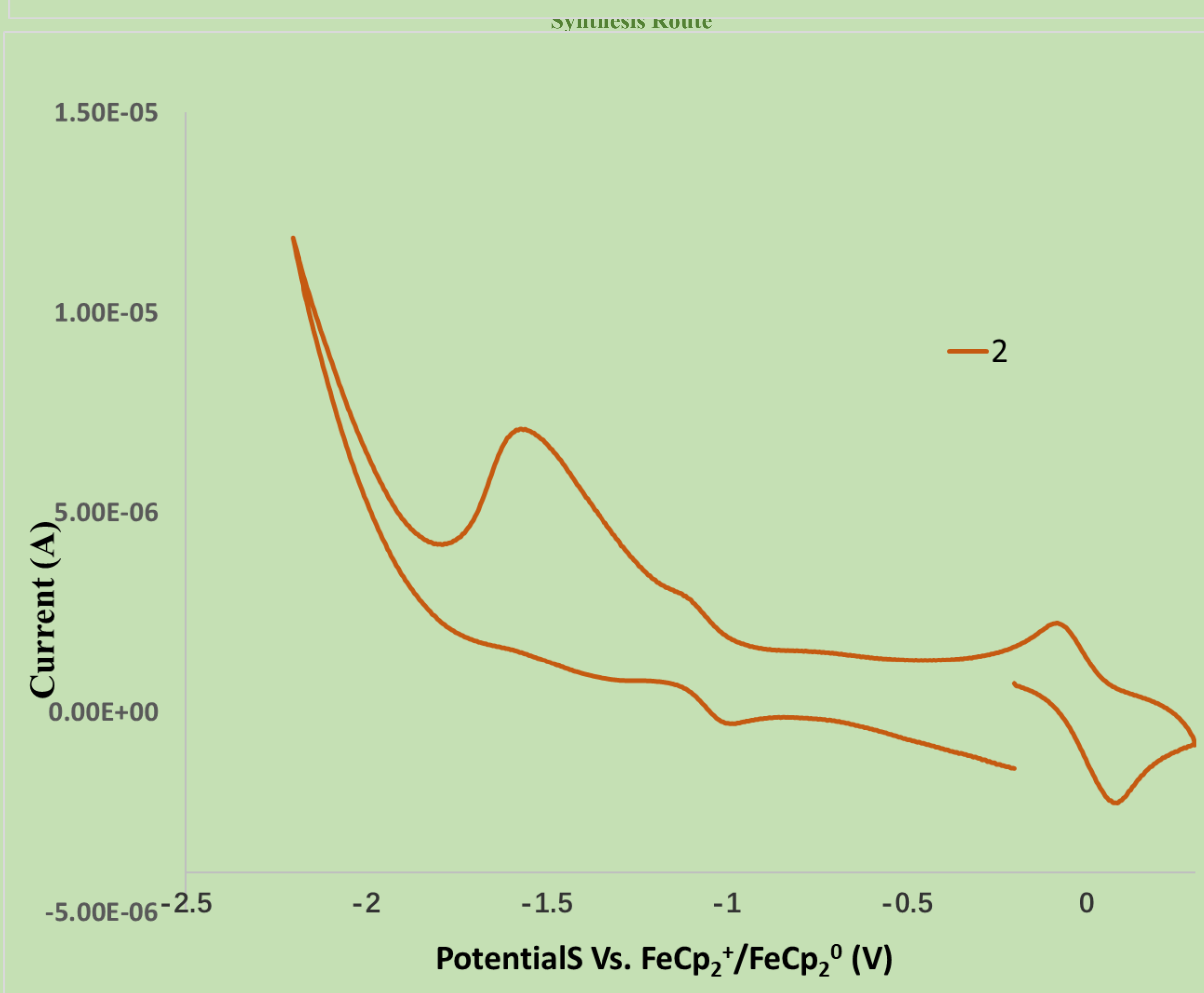
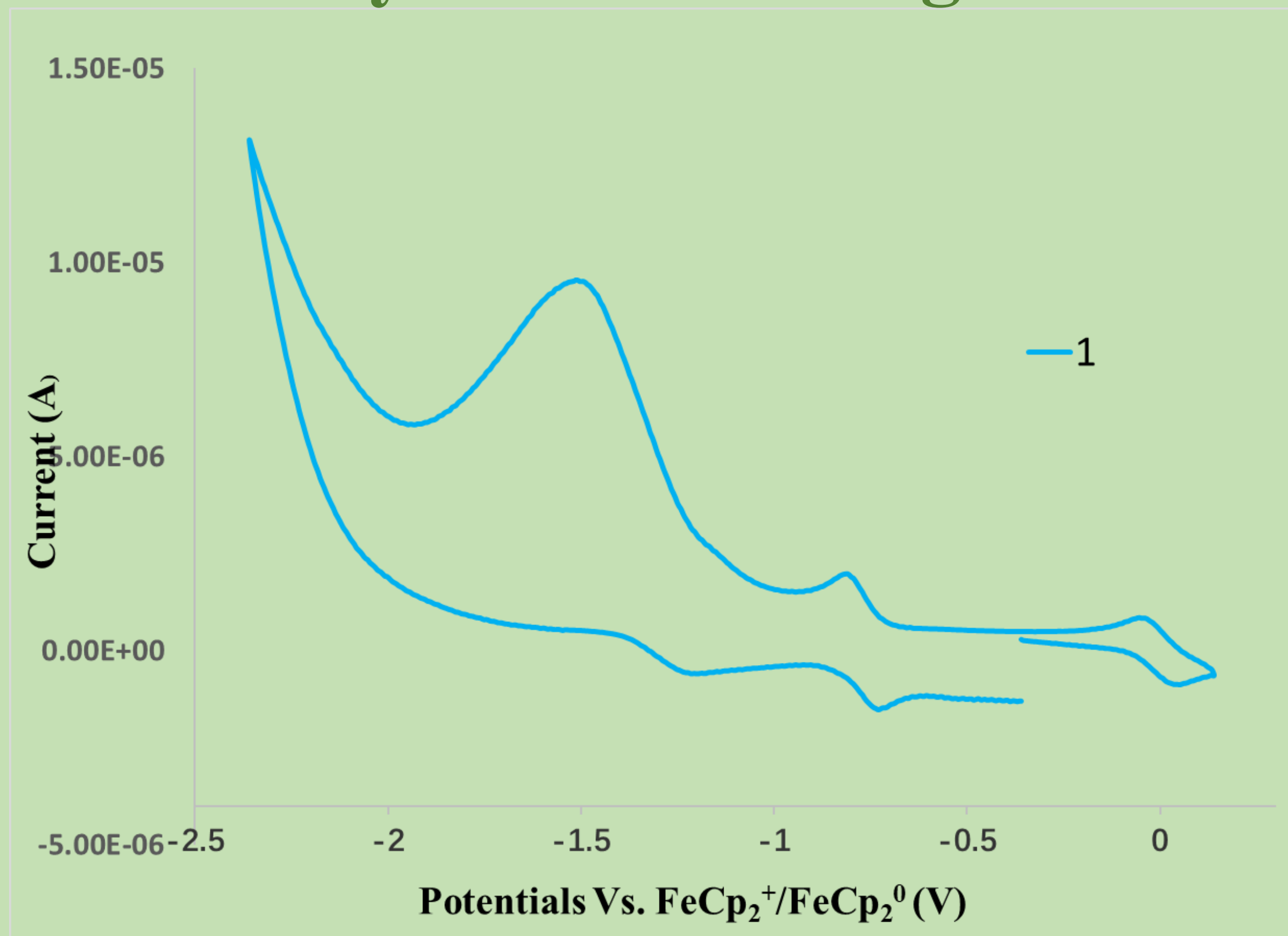
Tetraphenylene is a saddle-shaped molecule containing an eight-membered ring which is formed by four ortho-linked benzene rings. This unique structure enables tetraphenylene and its derivatives to attract the attention of not only synthetic but also applications in catalysis, materials science and molecular devices. Herein, we synthesized a tetraphenylene bridged tetraazapentacene dimer and will explore its applications in thin-film transistors in the future. The construction of tetraphenylene core is based on a palladium catalyzed dimerization of o-iodobiaryl method.¹ Following demethylation and oxidation afforded the critical building block containing two ortho-quinone moieties. Finally, condensation reaction under acidic conditions gave the rigid V-shaped tetraazapentacene dimer and diazapentacene dimer.



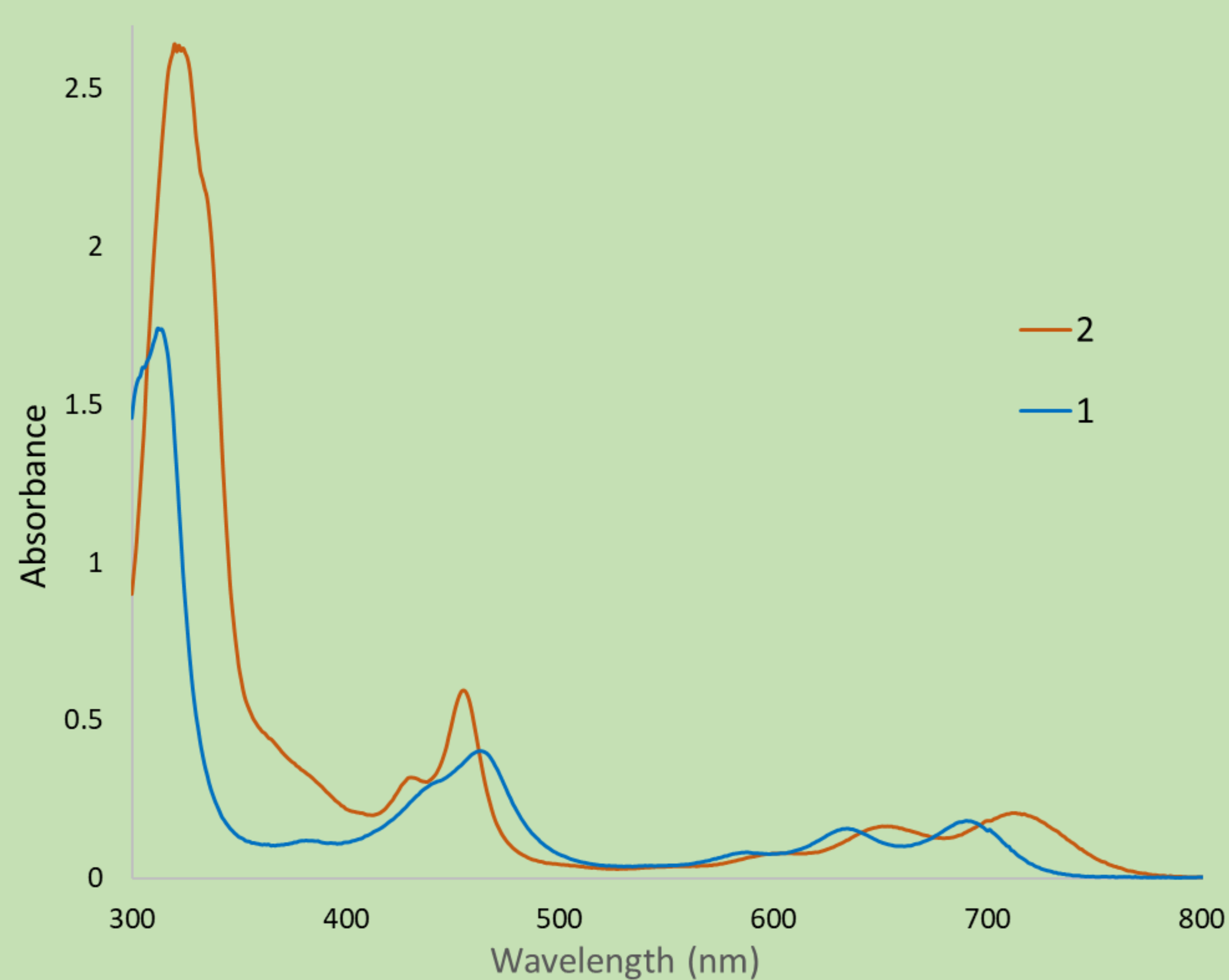
Synthesis Route



Cyclic voltammograms



Optical properties



Conclusion

We have successfully synthesized two different azaacene dimers by condensation reaction and explored their electronic and photophysical properties. We also found that compound 1 is a potential n-type semiconductor material. Investigation of organic semiconductor of our azaacene dimers is in progress.

Reference: (1) Zhu, C.; Zhao, Y.; Wang, D.; Sun, W.-Y.; Shi, Z. *Sci. Rep.* **2016**, 6 (1), 33131.

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