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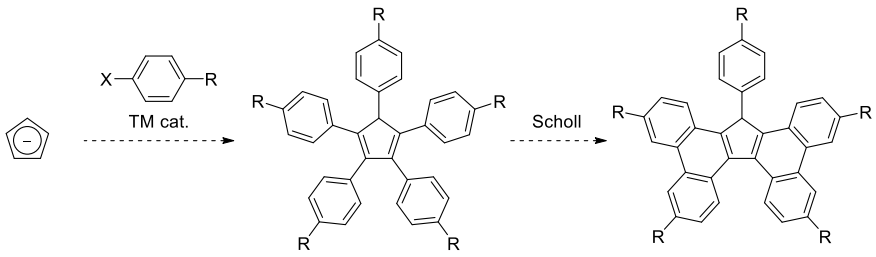
SYNTHESIS OF LUMINESCENT POLY-ARYLATED CYCLOPENTADIENES

Period	6 months beginning not later than: ☐ January ☐ February ☒ March ☐ April ☐ May ☐ June ☐ July ☐ September 2021
Internship supervisor(s)	name: Pr G. Rapenne, Dr C. Kammerer e-mail: gwenael.rapenne@cemes.fr, claire.kammerer@cemes.fr group: NanoSciences Group (GNS) - CEMES CNRS
Location	CEMES CNRS - UPR 8011 29 rue Jeanne Marvig - BP 94347 31055 Toulouse cedex 4, France
This research master's degree research project could be followed by a PhD	☒ YES ☐ NO

Poly-arylated cyclopentadienes have raised particular interest in the field of organic electronics, due to their luminescent properties.[1] In order to identify novel promising structures for electroluminescent materials, it is desirable to develop efficient synthetic routes towards poly-arylated cyclopentadiene derivatives, leading to a wide structural diversity. Dyker *et al*. have in particular reported a palladium-catalyzed cross-coupling reaction yielding poly-arylated cyclopentadienes in a single step from cyclopentadiene or zirconocene dichloride.[2]



In this project, the development of alternative cross-coupling conditions will be tackled, in order to strictly control the number of aryl substituents added on the cyclopentadiene scaffold and expand the functional group tolerance. Starting from cyclopentadienide as precursor and aryl halides as coupling partners, a family of poly-arylated cyclopentadienes will be obtained and fully characterized. In addition, these compounds will be submitted to Scholl reaction conditions to yield a variety of polyaromatic tetrabenzofluorenes.

References:

[1] Adachi, C.; Tsutsui, T.; Saito, S. *Appl. Phys. Lett.* **1990**, *56*, 799–801.

[2] Dyker, G.; Heiermann, J.; Miura, M.; Inoh, J.-I.; Pivsa-Art, S.; Satoh, T.; Nomura, M. *Chem. Eur. J.* **2000**, *6*, 3426–3433.

Keywords, areas of expertise	Cyclopentadienes, tetrabenzofluorenes, electroluminescent materials, cross-coupling reactions
Required skills for the internship	Skills in synthesis (including Schlenk techniques), purification and characterization of organic compounds