

Synthesis of poly(pyridyl)porphyrins by Heck and Sonogashira cross-coupling reactions

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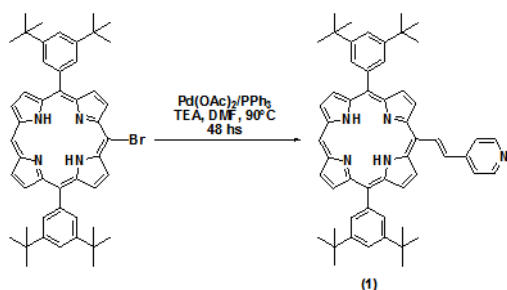
INTRODUCTION

Porphyrins are an interesting class of heteroaromatic 18 π -electron aromatic macrocycles that have found wide applications in many fields, including biologic systems, medicine, catalysis and materials¹. Such applications explore their optical, photochemical, photoelectrochemical, catalytic, binding and electrochemical properties^{2,3}.

In this work, we report the synthesis and spectroscopic characterization (¹H NMR, ESI-MS and UV-vis) of a new porphyrin substituted with vinylpyridine (**1**) and ethynyl-terpyridine (**2**).

RESULTS AND DISCUSSION

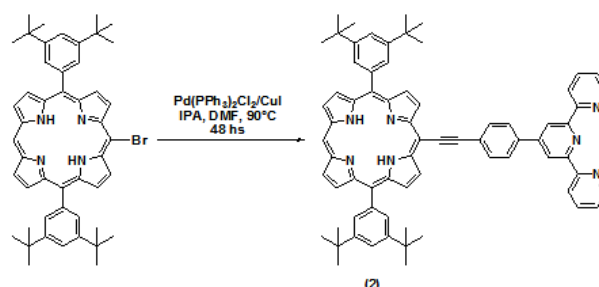
The *meso*-vinylpyridyl porphyrin (**1**) was obtained in DMF by the reaction of the brominated precursor and 3 equivalent of 4-vinylpyridine, in the presence of Pd(OAc)₂/PPh₃ as catalyst, and triethylamine as non-coordinant base (Scheme 1).



Scheme 1. Scheme of the synthesis of *meso*-(4-vinylpyridyl)porphyrin (**1**).

The *meso*-ethynyl(terpyridyl) porphyrin (**2**) was obtained in DMF by the reaction of the *meso*-brominated precursor and 2 equivalent of 4-

ethynylterpyridine, in the presence of [Pd(PPh₃)₂Cl₂] and CuI as catalyst, and iso-propylamine as non-coordinant base (Scheme 2).



Scheme 2. Scheme of the synthesis of *meso*-(4-ethynylterpyridyl)porphyrin (**2**).

CONCLUSION

This class of compound presents significant interest in supramolecular and coordination chemistry, as well as molecular nanoscience and molecular switches. Further studies are on the way to evaluate the photochemical and the photophysical properties of this new series of porphyrins with stilbene-pyridine and ethynyl-terpyridine substituents directly bond at the *meso*-position.

ACKNOWLEDGEMENTS

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