Synthesis and photophysical properties of 2,5-diaryl-indolizines

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Keywords: indolizines, organometallics, fluorescense

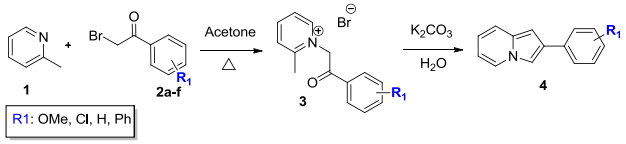
INTRODUCTION

The synthesis of fluorescent molecules has received considerable attention since these compounds can be used as electroluminescent materials, dyes and biomarkers.[1] Indolizines are important N-heterocyclic compounds that present interesting pharmacological effects. For example, they can function as anti-inflammatory agents, calcium entry blockers, cardiovascular and anti-tuberculosis agents.[2] Following our interest in the functionalization of aromatic and heterocyclic compounds using organometallic reagents, in this study we have studied the preparation of a library of 2,5-diaryl indolizines and investigated the photophysical properties of this new compounds.

RESULTS AND DISCUSSION

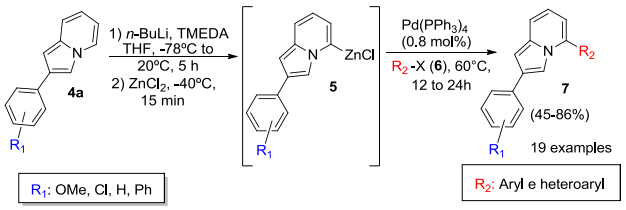
We initiated our study by applying the Tschitschibabin approach to the synthesis of 2-aryl indolizines of type **4** (Scheme 1).

Scheme 1. Tschitschibabin Reaction



Aiming to find the best reaction conditions for the Negishi reaction some catalyst systems and reactions conditions were screened for the cross-coupling reaction. Best results were observed when $Pd(PPh_3)_4$ (0.8 mol%) was used under THF reflux. Additionally, the use of the same protocol in the palladium catalyzed cross-coupling of different 2-aryl indolizines with various aryl halides has allowed the preparation of a library of 2,5-diaryl indolizines (**7**) in moderate to good yields (Scheme 2).

Scheme 2. Negishi Reaction



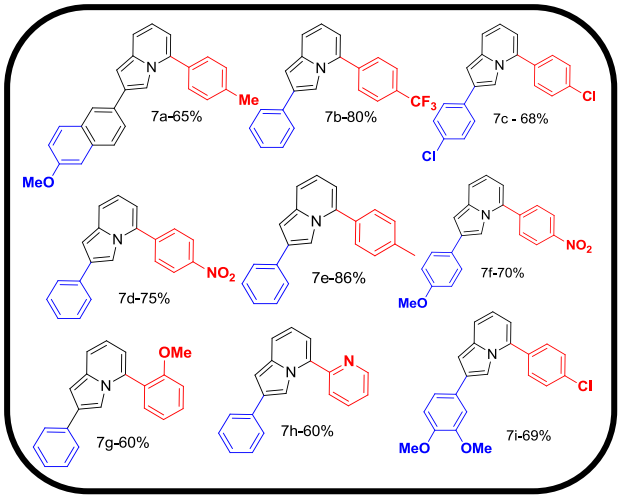


Figure 1. Some examples of 2,5-diaryl-indolizines.

Through this study it was possible to observe the fluorescence of some Indolizines synthesized by the method of Negishi reaction. (Figure 2)

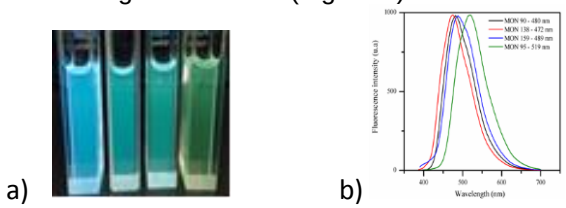


Figure 2. a) Fluorescence images of indolizines in DMSO,irradiated at 365 nm. b) Fluorescence spectra in DMSO of some 2,5-diaril indolizines (λ ~ 370nm).

CONCLUSION

In conclusion, palladium-catalyzed approach is an efficient method for the synthesis of 2,5-diaril-indolizines, giving rise to a broad variety of indolizines with pronounced fluorescence.

ACKNOWLEDGEMENTS

The authors are grateful for the support of FAPESP.

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