



Palladium complexes of aromatic *bis*-imines and *bis*-amines: synthesis and evaluation in Heck reactions.

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INTRODUCTION

Schiff bases have been described as good platforms for obtaining palladium-based organic complexes that work as catalysts for carbon-carbon cross coupling¹, such as Heck reaction.² This work focused on the synthesis and evaluation of the efficiency of Pd-*bis*-imines and Pd-*bis*-amines complexes as catalysts in Heck reaction.

RESULTS AND DISCUSSION

Three Pd-*bis*-imines (**Pd01** to **Pd03**) and three Pd-*bis*-amines (**Pd01R** to **Pd03R**) complexes were synthesized according to Deligönül and coworkers³ and the yields are shown in Figure 1.

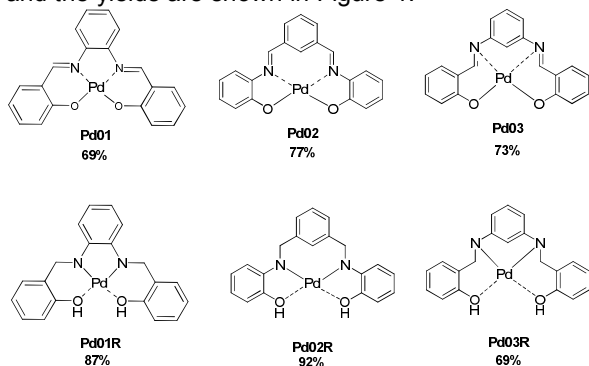
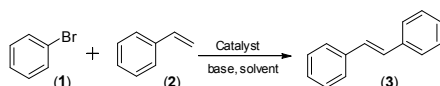


Figure 1. Palladium complexes synthesized and evaluated as catalysts in Heck reaction.

All complexes were employed in Heck reaction of bromobenzene (**1**) with styrene (**2**) (Scheme 1). The catalysts efficiency was assessed from the formation of *trans*-stilbene (**3**), monitored by gas chromatography coupled to mass spectrometry (GC/MS).



Scheme 1. Heck reaction subject of the present study.

The best yields (Table 1) were achieved when dimethylacetamide (DMA) and sodium carbonate were used as solvent and base, respectively, in

reactions maintained for 12 h in the presence of catalysts at 7.9×10^{-3} mol%.

Table 1. Efficiency of Pd-*bis*-imines and Pd-*bis*-amines complexes as catalysts in Heck reaction^a.

Catalyst	Yield (%)	TON ^b
Pd01	69	8,619
Pd02	77	9,577
Pd03	74	9,163
Pd01R	87	10,764
Pd02R	92	11,359
Pd03R	69	8,547

^aReaction conditions: bromobenzene at 36 mmol, styrene at 54 mmol, sodium carbonate at 2 mol%, catalyst at 7.9×10^{-3} mol% in DMA under argon atmosphere at 140 °C for 12 h. ^bTON, turnover number.

Overall, Pd-*bis*-amine complexes were better catalysts in comparison with the ones derived from *bis*-imines. The highest reaction yield was achieved when **Pd02R** was employed at 7.9×10^{-3} mol%, a concentration significantly lower than that described in the literature.⁴

CONCLUSION

All Pd-based complexes were shown to be efficient catalysts for Heck reaction providing the product in yields equal or higher than 70%.

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