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## Data article

# Synthesis of palladium(II) diimine complexes and their catalytic potential in sonogashira cross coupling reaction



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## ABSTRACT

Cross-coupling reactions catalyzed by various transition metal complexes are the most powerful synthetic tools for the generation of C=C and C≡C bonds. Significant efforts have been put into the modification of ligands to increase the catalytic efficiency of the transition metal complexes. In most cases, attention is only paid to highly efficient catalysts and unsuccessful examples are often ignored. In this work, four diimine compounds, R-dab, were synthesized by condensation reaction and then reacted with the precursor  $[\text{PdCl}_2(\text{MeCN})_2]$  to form a palladium(II) diimine,  $[\text{PdCl}_2(\text{R-dab})]$ , complex. Our initial hypothesis was that the strong *trans*-effect from the diimine ligand in  $[\text{PdCl}_2(\text{R-dab})]$  would enhance the rate of reductive elimination and subsequently promote the formation of cross coupling product. The catalytic efficiency of  $[\text{PdCl}_2(\text{R-dab})]$  complexes in Sonogashira cross coupling reactions were examined at a temperature of 70 °C by reacting methyl-4-bromobenzoate and 2-methylbut-3-yn-2-ol for 5 hours under nitrogen conditions. Unfortunately, our results showed that the  $[\text{PdCl}_2(\text{R-dab})]$  complexes are incapable of inducing the formation of cross coupling product. Despite the fact that these cross-coupling reactions were unsuccessful, we set out to explain the reasons for this failure herein

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