



Formal γ -alkynylation of ketones *via* Pd-catalyzed C-C cleavage

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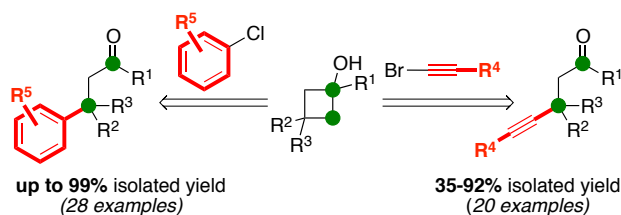
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β -Carbon Elimination; γ -Alkynylation; Palladium-Catalyzed

INTRODUCTION

An efficient Pd-catalyzed ketone γ -arylation *via* β -carbon elimination¹ with aryl chlorides, was recently developed in our group (Figure 1).² Encouraged by these results, and due to the prevalence of versatile alkyne motifs in numerous bioactive compounds and electronic materials, we set out to investigate the γ -alkynylation of cyclobutanols (Figure 1).³

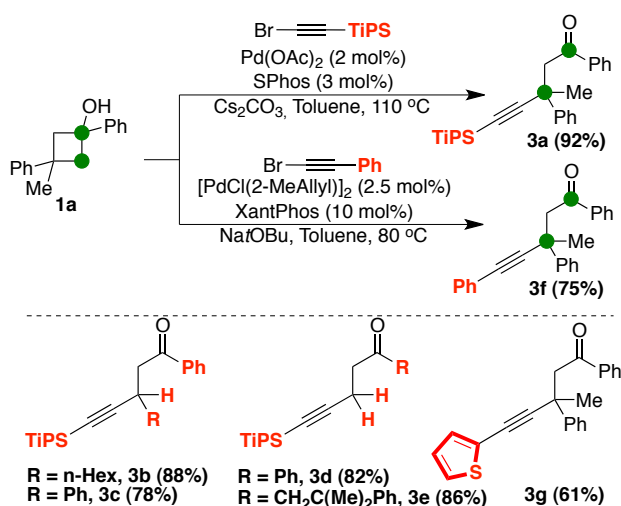
Figure 1. Synthesis of γ -Functionalized ketones



RESULTS AND DISCUSSION

After considerable optimization, we found that the combination of Pd(OAc)₂, SPhos and Cs₂CO₃ in toluene provided the best results for the coupling reaction of *tert*-cyclobutanols with (bromoethynyl)-triisopropylsilane (Figure 2). As presented, the reaction manifests a broad substrate scope in which both aromatic and aliphatic groups at different positions on the *tert*-cyclobutanol backbone.

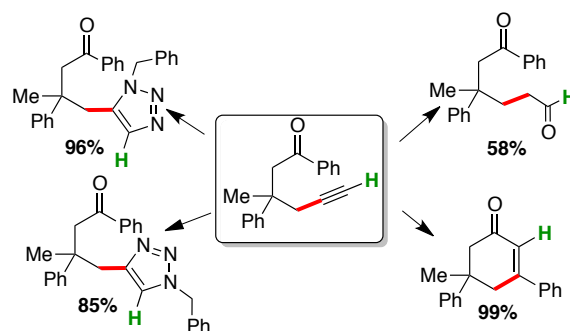
Figure 2. Scope of the reaction



We found that, the combination of [PdCl(2-MeAllyl)]₂, Xantphos and NaOtBu in toluene provided the best results when using non-silylated bromoacetylene derivatives.

As shown in figure 3, we demonstrate that this protocol could serve as a platform for molecular diversity (Figure 3).

Figure 3. Synthetic applicability



CONCLUSION

In conclusion, we developed the first route to γ -alkynyated ketones *via* Pd-catalyzed C-C bond cleavage.³ The reaction is characterized by its wide scope, thus becoming a new platform for molecular diversity.

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