

New Reactivity and Selectivity Using Transition Metal Catalysis

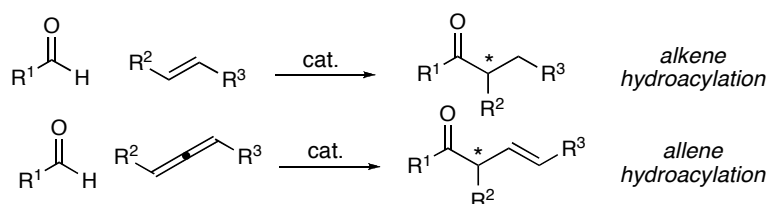
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Transition metal catalysed alkene hydroacylation is an attractive method for the preparation of ketone derivatives; it is an atom economic process, employs readily available substrates and can be achieved using relatively low catalyst loadings. Intramolecular variants, particularly those leading to the formation of cyclopentanones, have been extensively studied, and highly enantioselective variants have been developed.¹ Intermolecular reactions are more challenging, due mainly to competitive metal-catalysed reductive-decarbonylation. One successful strategy to achieve these difficult transformations has been to stabilize the key acyl-metal intermediates using chelation control.² The talk will illustrate how we have developed an efficient chelation-controlled intermolecular hydroacylation, and will discuss the reaction scope and limitations. Applications in heterocycle synthesis and in the development of an enantioselective process will also be presented.



1. For a review of transition metal catalyzed alkene and alkyne hydroacylation, see; Willis, M. C. *Chem. Rev.* **2010**, *110*, ASAP. (doi: 10.1021/cr900096x)
2. Contributions from this laboratory: (a) Willis, M. C.; McNally, J. S.; Beswick, P. J. *Angew. Chem. Int. Ed.* **2004**, *43*, 340. (b) Willis, M. C.; Randell-Sly, H. E.; Woodward, R. L.; Currie, G. S. *Org. Lett.* **2005**, *7*, 2249. (c) Willis, M. C.; Randell-Sly, H. E.; Woodward, R. L.; McNally, S. J.; Currie, G. S. *J. Org. Chem.* **2006**, *71*, 5291. (d) Moxham, G. L.; Randell-Sly, H. E.; Brayshaw, S. K.; Woodward, R. L.; Weller, A. S.; Willis, M. C. *Angew. Chem. Int. Ed.* **2006**, *45*, 7618. (e) Osborne, J. D.; Randell-Sly, H. E.; Currie, G. S.; Cowley, A. R.; Willis, M. C. *J. Am. Chem. Soc.* **2008**, *130*, 17232. (g) Osborne, J. D.; Willis, M. C. *Chem. Commun.* **2008**, 5025.