C-C BOND ACTIVATION INITIATED CASCADE PROCESSES

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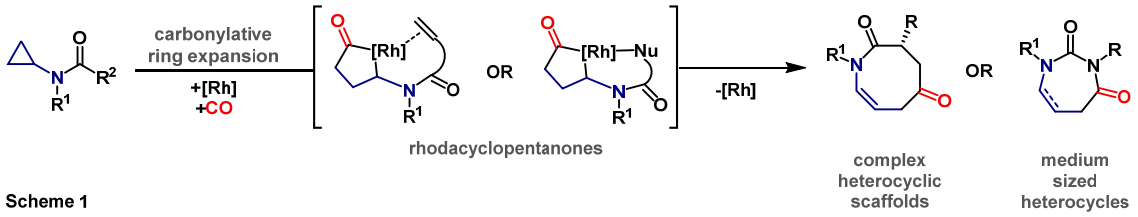
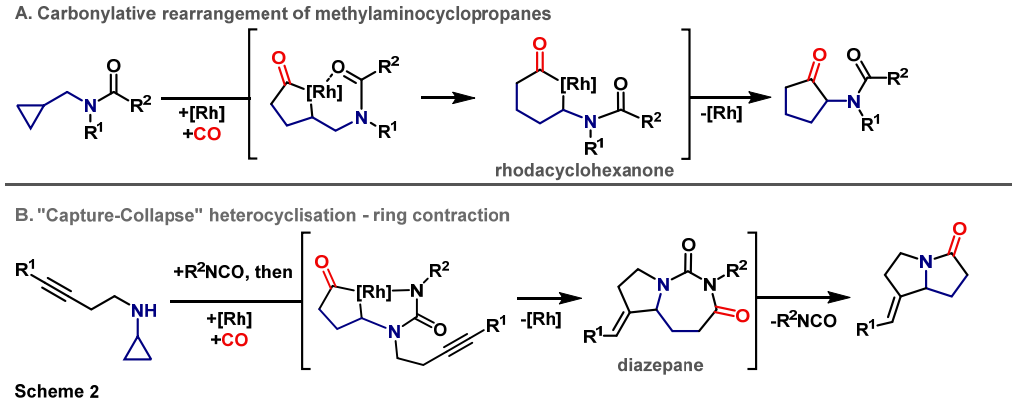
Within the last few years, a novel strategy for the directed carbonylative C-C bond activation of aminocyclopropanes has been developed [1,2]. Rhodacyclopentanones, formed under these conditions, can be trapped by tethered π-unsaturates or nucleophiles to provide a multitude of different cycloaddition products (Scheme 1).



Scheme 1

A new C-C bond activation triggered carbonylative rearrangement of aminomethylcyclopropanes, yielding α-aminocyclopentanones, was demonstrated (Scheme 2A). This process proceeds *via* the formation of an underrepresented rhodacyclohexanone. Studies will be presented where this methodology is expanded to include a range of substrates, as well as mechanistically similar cascade reactions. Further studies on the group's "capture-collapse" heterocyclisation protocol [2] will also be outlined. The initially formed diazepanes undergo an unusual ring contraction to provide γ-lactams. The process proceeds in a one-pot manner from corresponding aminocyclopropane and employs a "disappearing" urea directing group (Scheme 2B). The scope of the reaction is explored and further extended by concomitant cascade transformations.



Scheme 2

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[1] Shaw, M. H.; McCreanor, N. G.; Whittingham, W. G.; Bower, J. F. *J. Am. Chem. Soc.* **2015**, 137, 463.

[2] McCreanor, N. G.; Stanton, S.; Bower, J. F. *J. Am. Chem. Soc.* **2016**, 138, 11465.