Synthesis of functionalized alkylidenecyclobutanes

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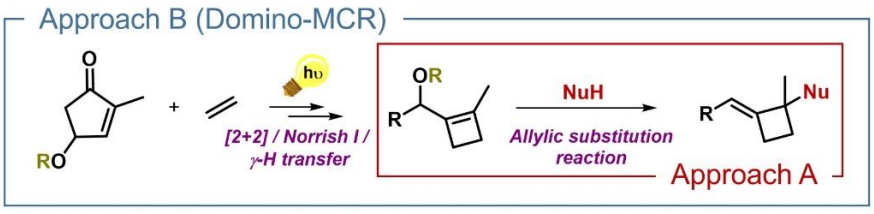
Cyclobutane derivatives have become increasingly important as molecular building blocks because of their inherent ring strain and the selective modification of their structures can be strategically used in organic synthesis.[1] Cyclobutane rings also appear in the molecular structures of a wide panel of natural and synthetic molecules that display interesting biological activities.[2]

Within this large family, alkylidenecyclobutane subunits are encountered in natural products, such as providencin,[3] and they exhibit enhanced reactivity providing access to complex molecular structures, including enlarged ring and functionalized cyclobutane derivatives.[4]

We recently described an efficient synthesis of cyclobutenes through a photochemical domino reaction starting from cyclopent-2-enones and ethylene.[5] In this poster, we will present two new developments: an original Brønsted acid-catalyzed allylic substitution reaction to convert functionalized cyclobutenes into alkylidenecyclobutanes (**approach A**)[6] and a straightforward domino-multicomponent reaction (MCR), which combines the photochemical sequence and this later (**approach B**).[7] These synthetic procedures provide an access to a wide variety of post-functionalized cyclobutane derivatives.

Figure 1. Approaches to functionalized alkylidenecyclobutanes.



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