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Houk-Jung
rganic Colloquium

**Stereoselective Synthesis and Applications of
Sulfonylcyclopropanols as Modular
Cyclopropanone and Homoenolate Equivalents**

Abstract: Cyclopropanone derivatives have long been regarded as unusable and elusive synthetic intermediates, mainly owing to their prominent ring strain and kinetic instability. In this work, we report the enantioselective synthesis of sulfonylcyclopropanols, shown to be modular and versatile synthetic equivalents of the corresponding cyclopropanone derivatives. These reagents were found to smoothly react in a variety of reaction manifolds, including organometallic 1,2-addition affording cyclopropanols, nitrene chemistry to access chiral β -lactams, nickel-catalyzed C–C activation to cyclopentenones, as well as olefination chemistry as a general platform to chiral alkylidenecyclopropanes and other substituted cyclopropanes. Moreover, we have shown that these sulfonylcyclopropanols can also behave as ‘electrophilic homoenolate’ equivalents, effectively acting as ring-opened 2- or 3-carbon linchpin reagents depending on the reaction conditions. This work constitutes the first general enantioselective route to cyclopropanone equivalents, thus unlocking a number of novel synthetic disconnections relevant to a variety of chemical industries.

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