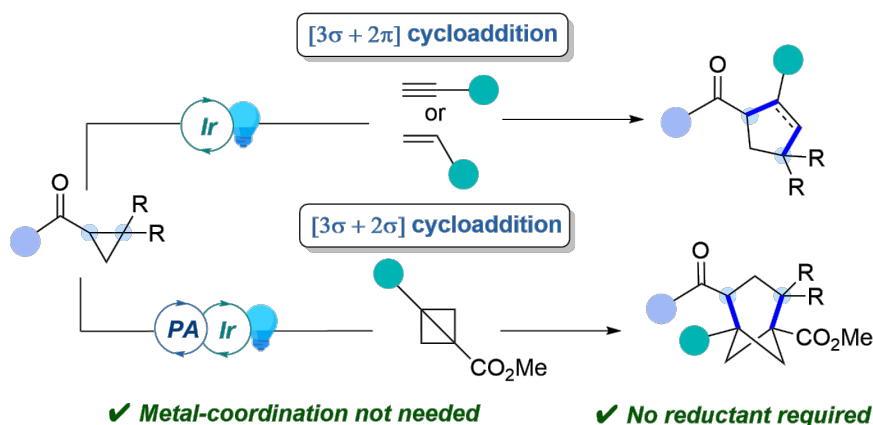


## Synthesis of bicyclo[3.1.1]heptanes and cyclopenta(e)nes by photocatalyzed cycloaddition of carbonyl cyclopropanes.

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Cyclopropanes play a key role in synthetic chemistry, both as structural elements and reactive building blocks.<sup>1</sup> The studies of donor-acceptor cyclopropanes are well-established in synthetic chemistry to enable C-C bond cleavage and generate 1,3 dipole intermediate for further transformation.<sup>1</sup> However, it is usually required a diester group as an acceptor. Cyclopropanes bearing a single carbonyl group are usually not sufficient to promote ring opening under mild condition.



In this study, we report a photocatalyzed homolytic ring-opening of carbonyl cyclopropanes under mild conditions without the need for a metal co-catalyst or a strong reductant. The resulting intermediate can be used for cycloaddition with alkynes, alkenes, and bicyclo[1.1.0]butanes, yielding cyclopentenenes, cyclopentanes, and bicyclo[3.1.1]heptanes (BCH) respectively.<sup>2</sup> In addition, bicyclo[3.1.1]heptanes have been recently studied as bioisosteres for *meta*-substituted aromatic rings.<sup>3</sup> Therefore, our protocol enables a convergent way to approach BCH scaffolds under mild and operationally simple conditions.

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