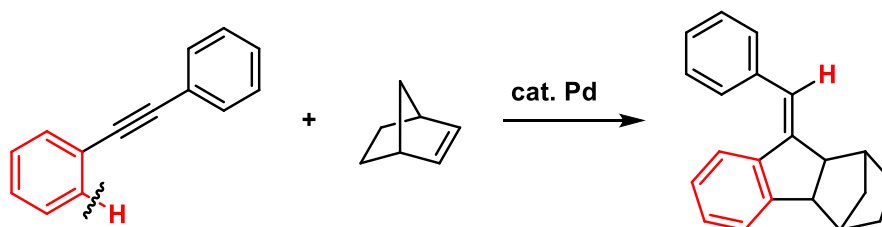


## Palladium-Catalyzed Annulation of Arylalkynes with Norbornenes via the C–H Bond Cleavage

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The catalytic annulation of phenylacetylene derivatives with alkenes is a straightforward and useful method for constructing ring structures of diverse sizes, depending on the reaction site of the phenylacetylene. Catalytic (4+2) cycloaddition of phenylacetylenes with alkenes to form six-membered rings has been extensively studied as intramolecular reactions employing gold or silver catalysts. Miura also reported a rhodium-catalyzed (4+2) cycloaddition of diphenylacetylene with norbornene or maleimide, providing the dihydronaphthalene derivatives.<sup>1</sup> In contrast, catalytic (3+2) cycloadditions between phenylacetylenes and alkenes, which yield a five-membered ring, have been less explored. For example, Catellani reported a palladium-catalyzed three-component cascade reaction of diphenylacetylene, norbornene, and aryl halides.<sup>2</sup> Subsequent reports of catalytic (3+2) cycloaddition also required halogenated substrates.<sup>3</sup> Herein, we will present a palladium-catalyzed (3+2) cycloaddition reaction of phenylacetylene derivatives with norbornene via *ortho*-C–H activation, in which no extra halogen group is needed.



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