Tandem C-H Activation of Alpha-Olefins in a Three Component Coupling

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A one-pot procedure for the synthesis of styrenyl allylic esters from terminal alkenes has been developed. A previously reported Pd(II)/sulfoxide system was used to generate branched allylic esters of alpha-olefins. With only the addition of a metallic aryl species to the reaction mixture, styrenyl allylic esters may be generated in good overall yields and excellent selectivities. The wide functional group tolerance and mild reactivity provide attractive reactivity for rapid build-up of dense functionality around terminal olefins with minimal protecting group strategies or undesirable oxidation/reduction reactions. This reaction takes advantage of a large class of commercially available, inexpensive hydrocarbon and singly functionalized substrates. The synthetic utility of this reaction has been demonstrated through the synthesis of several intermediates to biologically active molecules. The scope of the second step of the tandem sequences has also been shown to include protected alcohols without loss of selectivity.