Development of New Catalytic Reactions Involving the Activation of Traditionally Inert Bonds

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Organic molecules contain a variety of chemical bonds. Organic synthesis involves the cleavage of a chemical bond and the formation of a new chemical bond. However, not all of the chemical bonds in organic molecules have been used in organic synthesis. Thus, organic synthesis is heavily dependent on the reactivity of chemical bonds. If so-called unreactive bonds were to be used directly in organic synthesis, new possibilities for developing new synthetic methodologies would arise. We have utilized, not only the activation of C-H bonds, but also the activation of unreactive single bonds, such as C-C, C-O, C-N, and C-F bonds, and the activation of C-C triple bonds and C-O double bonds, in our quest to develop new types of transformations that will lead to further diversification in the field of organic synthesis.