Intramolecular Oxidative Nucleophilic Aromatic Substitution Reaction between Phenols and Alkenes

([1]*Faculty of Pharmacy, Keio University*)
○Hiroki Deguchi,[1] Kengo Hanaya,[1] Takeshi Sugai,[1] Shuhei Higashibayashi[1]
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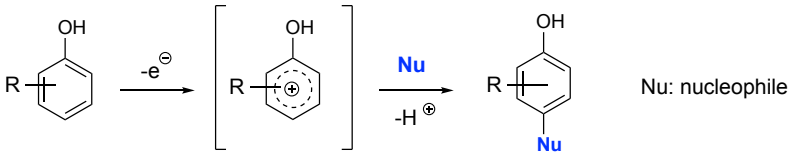
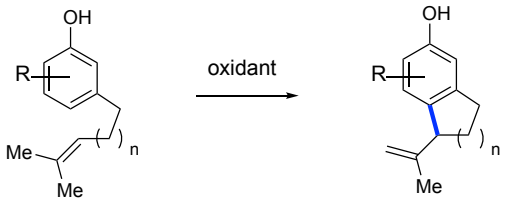
Oxidative phenol coupling reaction is a versatile transformation for the syntheses of various bioactive substances, pharmaceuticals, and functional molecules. Electron-rich phenols express nucleophilic reactivity. However, oxidative activation can convert these phenols into cations or electron-deficient species, which would react with appropriate nucleophiles to perform nucleophilic aromatic substitution (Scheme 1). Under this concept, various oxygen or nitrogen nucleophiles have been reported for the formation of C-O or C-N bond. However, reported carbon nucleophiles were limited in such as aromatics or 1,3-dicarbonyl compounds. Exploration of new carbon nucleophiles along this methodology would allow us to synthesize a more variety of molecular skeletons of useful compounds. Herein, we succeeded to develop novel intramolecular oxidative nucleophilic aromatic substitution of phenol derivatives with alkenes as carbon nucleophiles.



Scheme 1

Cyclization of phenol derivatives **1** bearing alkenyl side chains through intramolecular oxidative nucleophilic aromatic substitution was investigated (Scheme 2). By applying organic oxidants, the phenol substrates **1** underwent the desired cyclization, giving expected bicycles **2**. In this presentation, we report the elaboration of the reaction conditions and the scope of the aromatic rings and alkenyl side chains.



1 **2**

Scheme 2