Generation of α-Iminyl Radicals from α-Bromo *N*-Sulfonylimines by Photoredox Catalyst and Application to Various Radical Reactions

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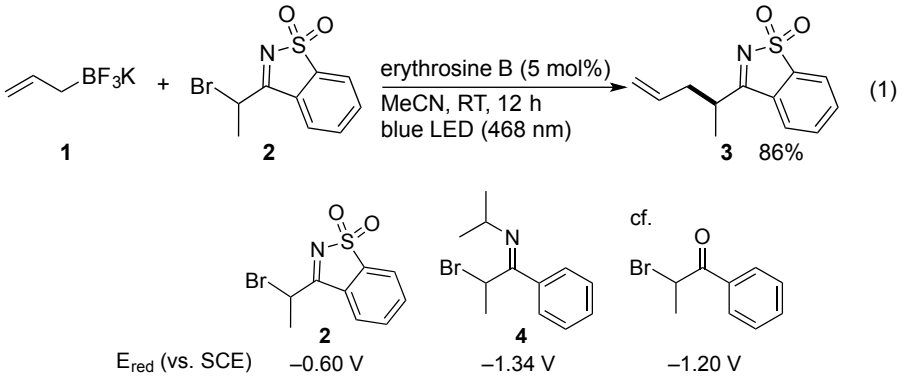
Radical reactions catalyzed by a photoredox catalyst have gained much attention in organic chemistry.[1] α-Iminyl radicals are useful candidates as intermediates for the synthesis of imine-containing compounds which have wide application such as the synthesis of the chiral α-tertiary amines.[2] However, the generation of the α-iminyl radicals by a photoredox catalyst has not been reported. Recently, our group has reported organic dye catalyzed radical coupling reaction of α-bromocarbonyls with potassium allyltrifluoroborate or silyl enol ethers under visible light irradiation.[3] Based on these studies, we designed and synthesized α-bromo cyclic *N*-sulfonylimines as precursors of α-iminyl radicals and applied them to various radical coupling reactions. Herein, we report the visible-light-promoted radical coupling reaction of α-bromo *N*-sulfonylimines with various radical acceptors in the presence of a photoredox catalyst.[4]

The reaction of allyltrifluoroborate **1** (3 equiv) with α-bromo *N*-sulfonylimines **2** (1 equiv) in the presence of erythrosine B (5 mol%) under visible light (blue LED) irradiation proceeded to give the coupling product **3** in 86% yield (eq. 1). When α-bromoimine **4** was used instead of **2**, the reaction did not proceed at all. The reduction potential of **2** and **4** were measured by cyclic voltammetry, and it was found that α-bromo *N*-sulfonylimines **2** was more easily reduced than the simple *N*-alkyl-substituted α-bromo imine **4**. In this reaction, the bromoimine **2** reacted with various radical accepotors as allylsilanes, silyl enol ethers, external olefin effectively.



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