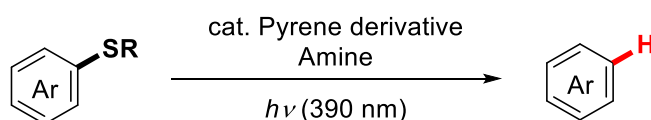


Photoinduced Hydrodesulfurization of Alkylthio Group-substituted Aromatic Compounds via C(sp²)-S Bond Cleavage

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Keywords: C–S Bond Cleavage; Photoinduced Electron Transfer; Pyrene; Desulfurization; Thioether

The discovery of new catalytic transformations via the cleavage of inert bonds constitutes one of the most active research areas in modern organic chemistry. In this context, various coupling reactions via the cleavage of C(sp²)–S bonds of aryl thioethers have been developed.¹⁾ An efficient hydrodesulfurization of arylmethyl thioethers is attractive to realize using methyl sulfides as removable directing groups in transition metal-catalyzed organic reactions.²⁾ Conventional methods for cleaving C–S bonds require the use of stoichiometric amounts of highly reactive reagents. Although transition metal-catalyzed hydrodesulfurizations of aryl thioethers using hydrosilanes were recently developed, the strong affinity of sulfur to transition metals generally stabilizes the intermediates and quench the catalytic cycle. Therefore, metal reagents/transition metal-free system is suitable and ideal for efficient hydrodesulfurizations. Herein, we report a visible light-induced hydrodesulfurization via C(sp²)-S bond cleavage of alkylthio group-substituted aromatic compounds catalyzed by a dual functional pyrene catalyst, which does not require hydrosilanes, transition metal catalysts, or stoichiometric amounts of metal reagents. Mechanistic studies were also conducted by spectroscopic measurements and control experiments.



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