

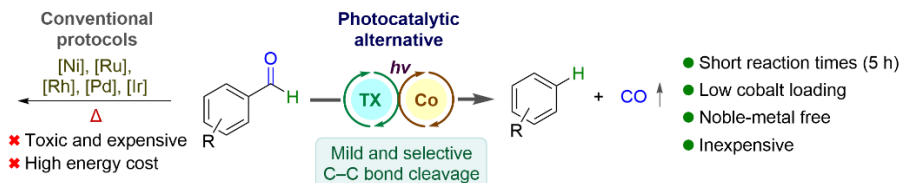
Decarbonylation of Benzaldehydes by Dual Photoorgano-Cobalt Catalysis

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In nature, the defunctionalization of aldehydes to alkanes is catalyzed by enzymes known as decarbonylases in a mild fashion. In the laboratory, however, the main strategies in the chemist's repertoire depend on the combination of noble-metal catalysts and high temperatures, wherein C–H insertion of the metal into the aldehyde bond plays a key role. In the last years, progress has been made within the field of photochemistry to offer milder and more sustainable alternatives. Simultaneously, there is growing interest for new methodologies designed to defunctionalize and process biologically derived materials, reducing its oxygen content. We report a mild alternative to thermally driven noble-metal catalyzed decarbonylation protocols for the defunctionalization of benzaldehydes in short reaction times. Our cooperative photocatalytic system involves thioxanthone as an inexpensive HAT-agent and a cobalt complex required for selective C(sp²)–C(sp²) bond cleavage. The generated acyl and phenyl intermediates are postulated to be stabilized as cobalt complexes. Several mechanistic studies have been performed to confirm carbon monoxide evolution and the formation of the postulated acyl radicals.



[1] D. Kolb *et al.*, Chem. Commun., 2023,**59**, 8592-8595, 10.1039/D3CC02170J