

## Defluorinative C–O Coupling between Trifluoromethylarenes and Alcohols via Copper Photoredox Catalysis

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Fluorine-containing organic compounds possess distinctive biological and physiochemical properties and are thus widely applied in material science, pharmaceuticals as well as agrochemicals and commodity chemicals.<sup>1</sup> Selective defluorination of trifluoromethyl arenes would offer a convenient pathway for the synthesis of valuable products. This transformation is however challenging, where recent progress in this area mainly focuses on the conversion of C–F into C–C bonds via olefin addition. By contrast, C–heteroatoms formation is largely missing but can potentially provide new molecules with novel properties.

Photoredox catalysis has in the past decades emerged as a prestigious method to activate traditionally inert substrates. A recent trend in this field features the utilization of base metals (e.g., Cu, Fe, Ni) instead of precious metals (e.g., Ir, Ru).<sup>2</sup> We envision that by applying a suitable base metal photocatalyst, not only can the trifluoromethyl groups be activated mildly and selectively, but the catalyst can also enable the subsequent cross-coupling cycles to forge the desired chemical bonds. Herein, we report a copper-catalyzed defluorinative coupling of trifluoromethyl arenes to form C–heteroatom bonds.<sup>3</sup> The copper catalyst is proposed to serve dual catalytic roles: photoredox catalysis for trifluoromethyl reduction and cross-coupling catalysis to form the C–heteroatom bond. Under the optimized conditions, C–O and C–halogen bonds formation occurred smoothly, where ArCF<sub>3</sub> is converted into the corresponding ether and halide products. These new molecular entities are expected to provide novel properties as pharmaceuticals, material components or commodity chemicals. **[ref. This body consists of 241 words.]**



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