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A Dual Cobalt and Photoredox Catalysis for Hydrohalogenation of Alkenes
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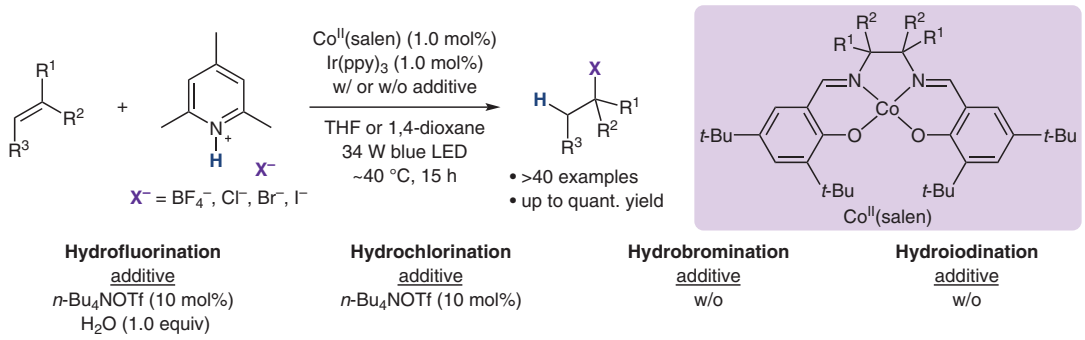
Hydrohalogenation of Alkenes Using Collidine·HX Salts under Dual Cobalt and Photoredox Catalysis



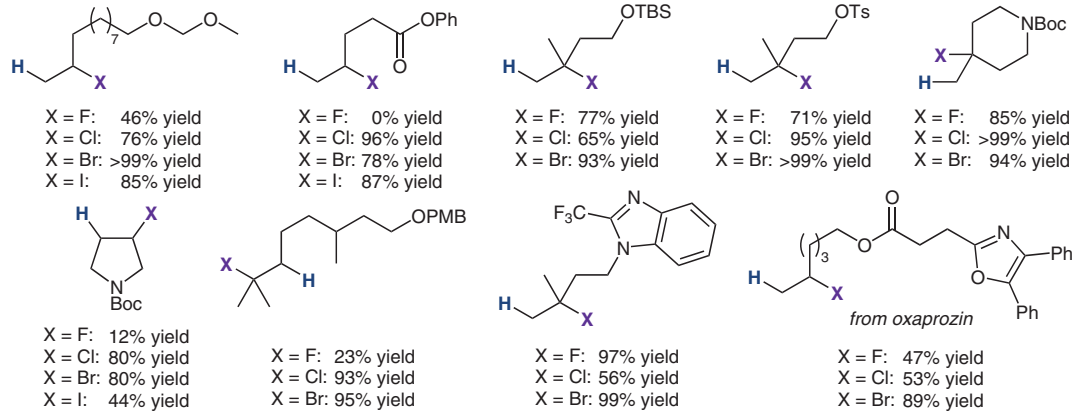
Hydrofluorination
additive
n-Bu_4NOTf (10 mol%)
H_2O (1.0 equiv)

Hydrochlorination
additive
n-Bu_4NOTf (10 mol%)

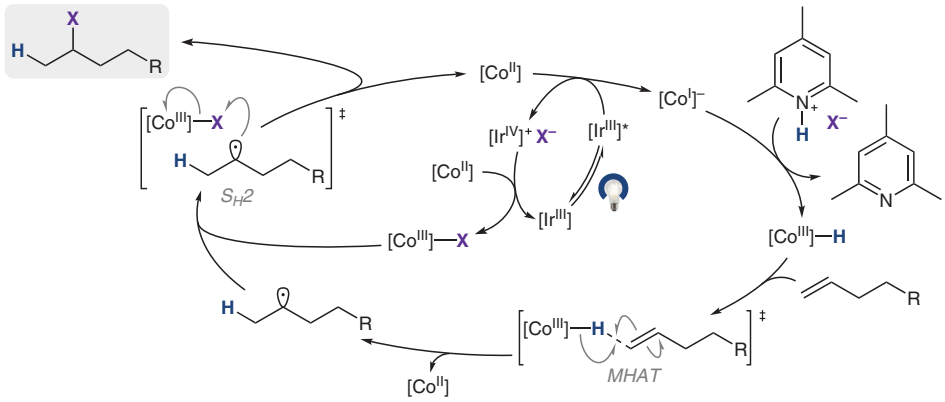
Hydrobromination
additive
w/o

Hydroiodination
additive
w/o

Selected examples:



Proposed mechanism:



Significance: A dual photoredox- and cobalt-catalyzed protocol for the hydrohalogenation of aliphatic alkenes using inexpensive and safe-to-handle collidine salts as HX surrogates is disclosed.

Comment: This dual catalysis exploits a radical-based umpolung strategy, in which a proton and a halide anion are converted into a nucleophilic hydrogen radical and an electrophilic halogen radical, respectively.

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Category
Metals in Synthesis

Key words
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cobalt catalysis
hydrohalogenation
photoredox catalysis

Synfact of the Month