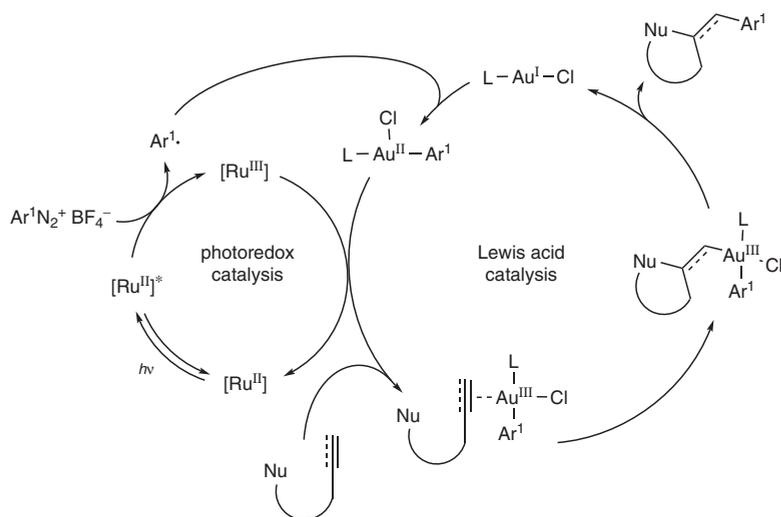


1.2.4 Gold/Photocatalyst Dual Catalysis

L. Barriault, M. Zidan, S. Rohe

The use of gold catalysts in classical two-electron cross-couplings is notoriously impractical due to the high oxidation potential of gold(I)/gold(III) [e.g., $E_0(\text{Au}^{\text{I}}/\text{Au}^{\text{III}}) = +1.36 \text{ V}$]. However, when used in tandem with photocatalysts, the gold center can be oxidized one electron at a time, making cross-coupling style reactions with gold more viable. The gold(III) intermediate also has the potential to act as a Lewis acid prior to its reductive elimination step, which has spurred development of multi-bond-forming dual catalytic transformations. This dual-catalytic strategy is also applied in reactions with gold as a photocatalyst in conjunction with an organocatalyst to effectuate traditionally challenging cross couplings.



Keywords: photochemistry · Lewis acid catalysts · gold complexes · cross-coupling reactions · diazonium salts · free radicals · tandem reaction