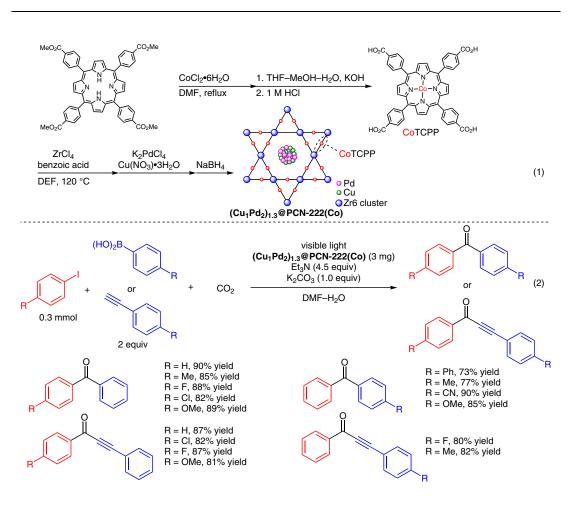
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Feeding Carbonylation with CO₂ via the Synergy of Single-Site/Nanocluster Catalysts in a Photosensitizing MOF J. Am. Chem. Soc. **2021**, 143, 20792–20801, DOI: 10.1021/jacs.1c08908.

Carbonylative Suzuki-Miyaura and Sonogashira Coupling Reactions with CO₂ as a C1 Source



Significance: A porphyrin-based metal-organic framework containing cobalt, copper, and palladium [(Cu₁Pd₂)_{1,3}@PCN-222(Co)], prepared according to Equation 1, catalyzed the carbonylative Suzuki-Miyaura coupling of aryl iodides with arylboronic acids and CO₂ as a C1 source in the presence of Et₃N and K₂CO₃ under visible-light irradiation to give the corresponding benzophenone derivatives in up to 90% yield. Similarly, arylboronic acids and aralkynes underwent carbonylative Sonogashira coupling reactions to give the corresponding diaryl alkynes in up to 87% yield.

Comment: The cobalt sites of (Cu₁Pd₂)_{1.3}@PCN-**222(Co)** catalyze the photoreduction of CO₂ under visible-light irradiation to give CO, which serves as a C1 source. Under an argon atmosphere, the Suzuki-Miyaura coupling reaction of iodobenzene and phenylboronic acid gave biphenyl. In the reaction of iodobenzene with phenylboronic acid and CO₂, the catalyst was recovered and reused four times without significant loss of its catalytic activity.

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Polymer-Supported

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