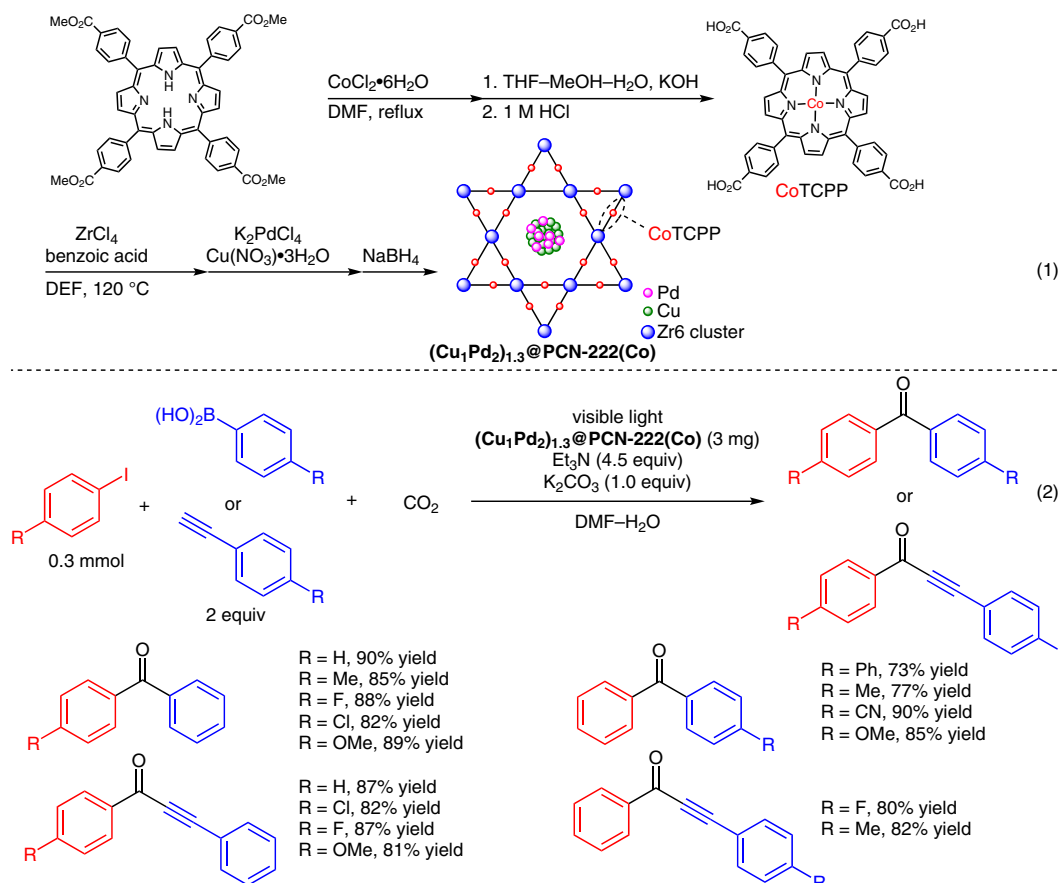


# Carbonylative Suzuki–Miyaura and Sonogashira Coupling Reactions with CO<sub>2</sub> as a C1 Source



**Significance:** A porphyrin-based metal–organic framework containing cobalt, copper, and palladium [ $(\text{Cu}_1\text{Pd}_2)_{1.3}@\text{PCN-222}(\text{Co})$ ], prepared according to Equation 1, catalyzed the carbonylative Suzuki–Miyaura coupling of aryl iodides with arylboronic acids and CO<sub>2</sub> as a C1 source in the presence of Et<sub>3</sub>N and K<sub>2</sub>CO<sub>3</sub> under visible-light irradiation to give the corresponding benzophenone derivatives in up to 90% yield. Similarly, arylboronic acids and alkynes underwent carbonylative Sonogashira coupling reactions to give the corresponding diaryl alkynes in up to 87% yield.

**Comment:** The cobalt sites of  $(\text{Cu}_1\text{Pd}_2)_{1.3}@\text{PCN-222}(\text{Co})$  catalyze the photoreduction of CO<sub>2</sub> 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 CO<sub>2</sub>, the catalyst was recovered and reused four times without significant loss of its catalytic activity.