Formylation of Aryl Iodides with CO$_2$ Using Palladium on Carbon

Significance: Palladium on carbon (Pd/C) catalyzed the formylation of aryl iodides in the presence of poly(methylhydrosiloxane) (PMHS) and 1,8-diazabicyclo[5.4.0]undec-7-ene (DBU) under a CO$_2$ atmosphere in acetonitrile to give aryl aldehydes in up to 81% yield (20 examples).

Comment: The formylation of aryl iodides to aryl aldehydes using CO$_2$ as a C1 resource was achieved. The authors previously reported the cyclization of ortho-phenylenediamines to benzimidazoles (Green Chem. 2013, 15, 95) and 2-aminothiophenol to benzothiazolone (ACS Catal. 2013, 3, 2076) using CO$_2$ as a C1 resource.

Selected examples:

- $\text{Ar} = \text{Ph}$, 77% yield
- $\text{Ar} = \text{Ph}$, 71% yield
- $\text{Ar} = \text{Ph}$, 66% yield
- $\text{Ar} = \text{Ph}$, 62% yield
- $\text{Ar} = \text{Ph}$, 60% yield

- $\text{Ar} = \text{Ph}$, 81% yield
- $\text{Ar} = \text{Ph}$, 64% yield
- $\text{Ar} = \text{Ph}$, 60% yield
- $\text{Ar} = \text{Ph}$, 57% yield
- $\text{Ar} = \text{Ph}$, 12% yield

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