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A Recyclable Nanoparticles-Supported Palladium Catalyst for the Hydroxycarbonylation of Aryl Halides in Water
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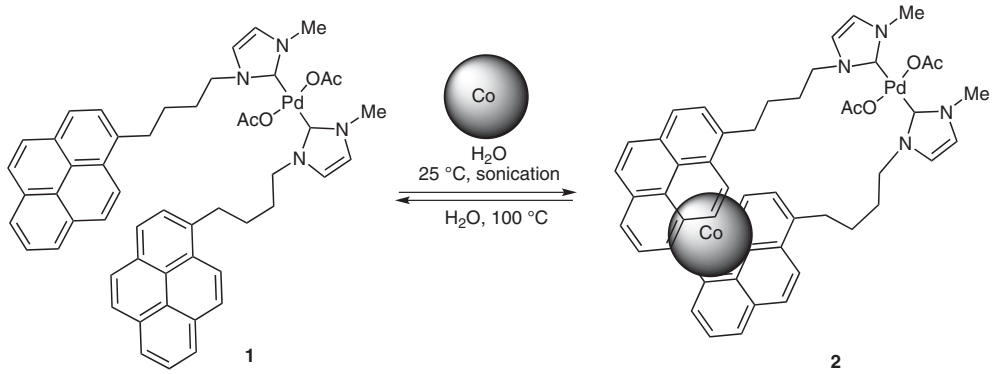
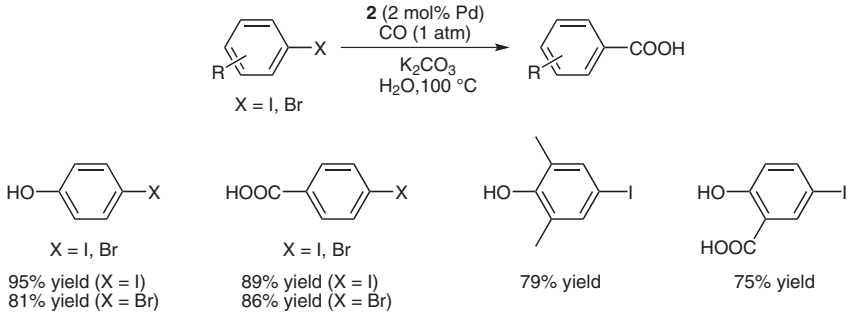
# Graphene-Coated Cobalt Nanoparticles-Supported Palladium Catalyst




**Significance:** The palladium complex **1** was immobilized on the graphene-coated cobalt nanoparticles via π–π-stacking interaction between pyrene units and the graphene layer. In boiling water, immobilized palladium complex **2** was dissociated to the palladium complex **1** and catalyzed the hydroxycarbonylation of aryl halides to give the corresponding carboxylic acids in up to 95% yield (6 examples). After the reaction, palladium complex **1** was recaptured on graphene layer at room temperature and recovered as palladium complex **2** by magnetic decantation and reused 15 times without significant loss of its catalytic activity.

**Comment:** The palladium complex **2** was characterized by IR, TEM, and EELS analyses. The catalyst was almost quantitatively recovered after each run and 0.7 ppm of palladium leaching into the products phase was observed by ICP-AES analysis in a representative run.

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**Category**

**Polymer-Supported Synthesis**

**Key words**

**NHC-Pd complex**

**cobalt nanoparticles**

**π–π-stacking interactions**

**catch–release system**

**hydroxy-carbonylation**