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Stabilisation of Carbon-Supported Palladium Nanoparticles through the Formation of an Alloy with Gold: Application to the Sonogashira Reaction
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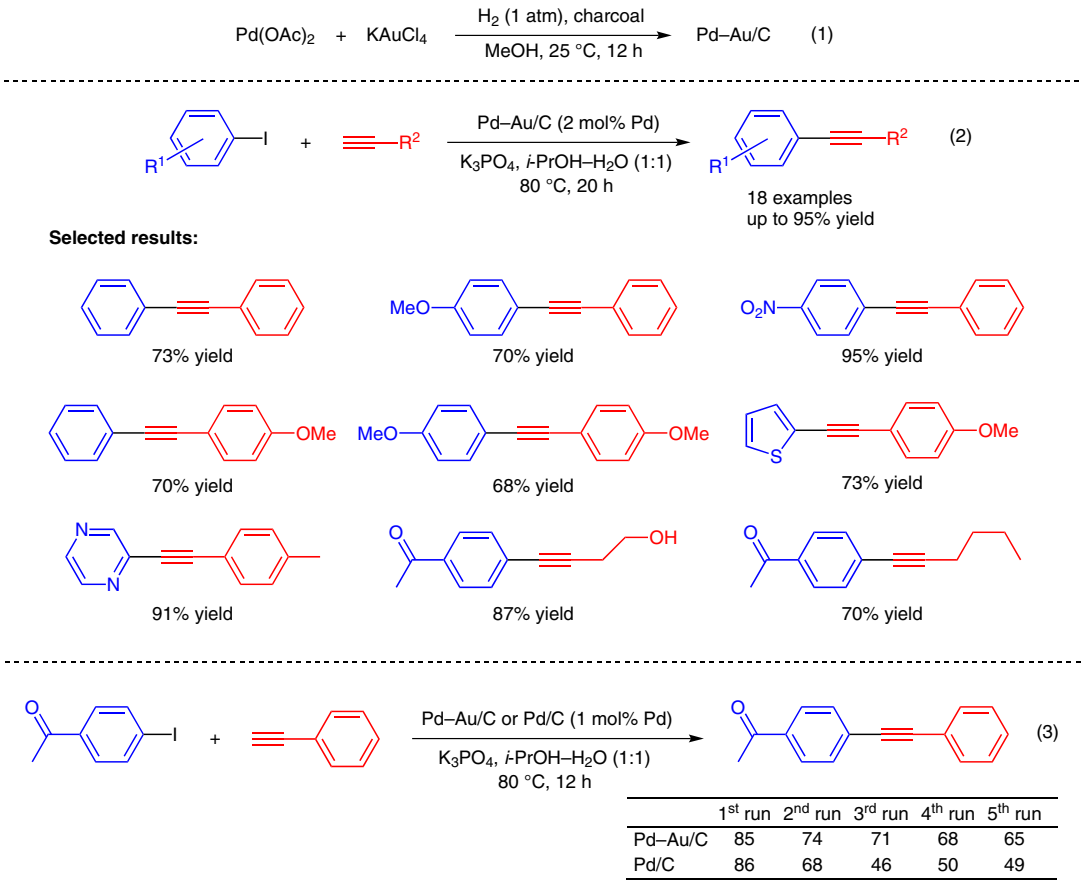
Sonogashira Coupling with Bimetallic Pd–Au Nanoparticles on Carbon



	1st run	2nd run	3rd run	4th run	5th run
Pd–Au/C	85	74	71	68	65
Pd/C	86	68	46	50	49

Significance: Bimetallic palladium–gold nanoparticles on carbon (Pd–Au/C) were prepared by treatment of a mixture of $Pd(OAc)_2$, $KAuCl_4$ and charcoal in methanol with H_2 (eq. 1). Pd–Au/C catalyzed the Sonogashira coupling of aryl iodides with terminal alkynes under copper-free conditions to give the corresponding diaryl alkynes in up to 95% yield (18 examples, eq. 2).

Comment: The Pd–Au/C nanoparticles were characterized by TEM, XRD, STEM-EDX, XPS and CV analyses. Though the catalytic activity of fresh Pd–Au/C was similar to that of fresh Pd/C, Pd–Au/C showed high stability during the recycling experiments (eq. 3). TEM analysis showed that the morphology of the recovered Pd–Au/C was unchanged after the third run.

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Category
Polymer-Supported Synthesis

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bimetallic palladium gold nanoparticles
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aryl iodides
alkynes