C. ROSSY, J. MAJIMEL, E. FOUQUET, C. DELACÔTE, M. BOUJTITA, C. LABRUGÈRE, M. TRÉGUER-DELAPIERRE,* F.-X. FELPIN* (UNIVERSITÉ DE NANTES, UNIVERSITÉ DE BORDEAUX, TALENCE AND UNIVERSITÉ DE BORDEAUX, PESSAC, FRANCE)
Stabilisation of Carbon-Supported Palladium Nanoparticles through the Formation of an Alloy with Gold: Application to the Sonogashira Reaction
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Category

Polymer-Supported Synthesis

Key words

bimetallic palladium gold nanoparticles

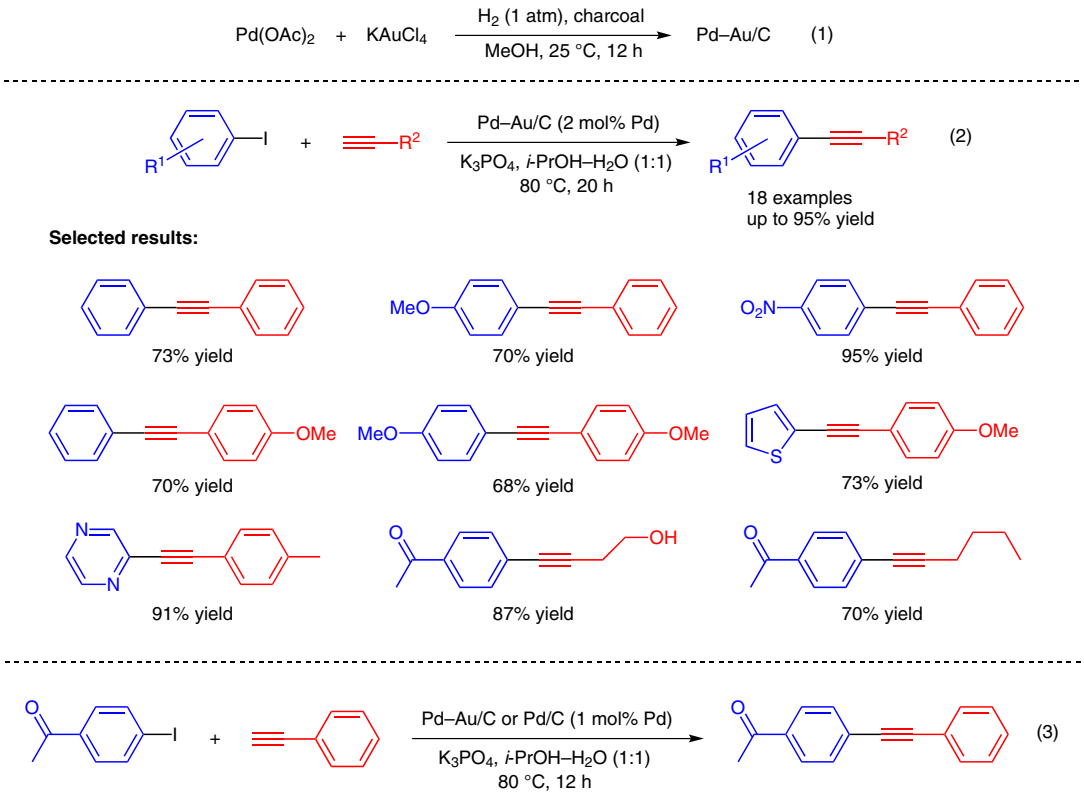
carbon

Sonogashira coupling

aryl iodides

alkynes

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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