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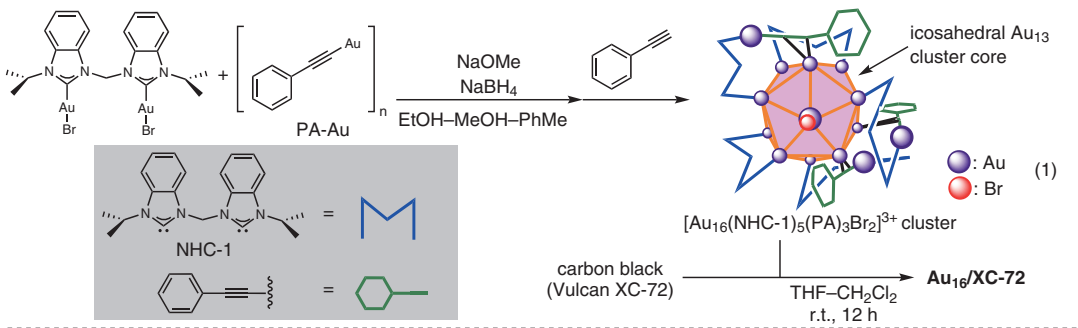
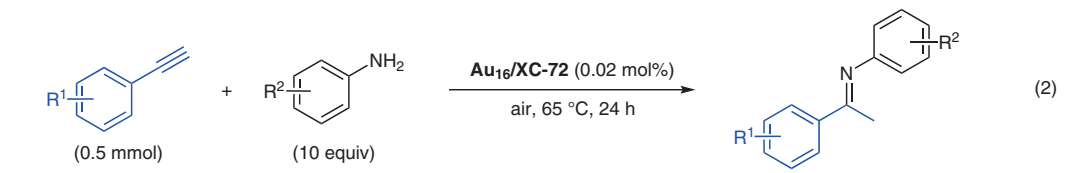
N-Heterocyclic Carbene-Stabilized Gold Nanoclusters with Organometallic Motifs for Promoting Catalysis

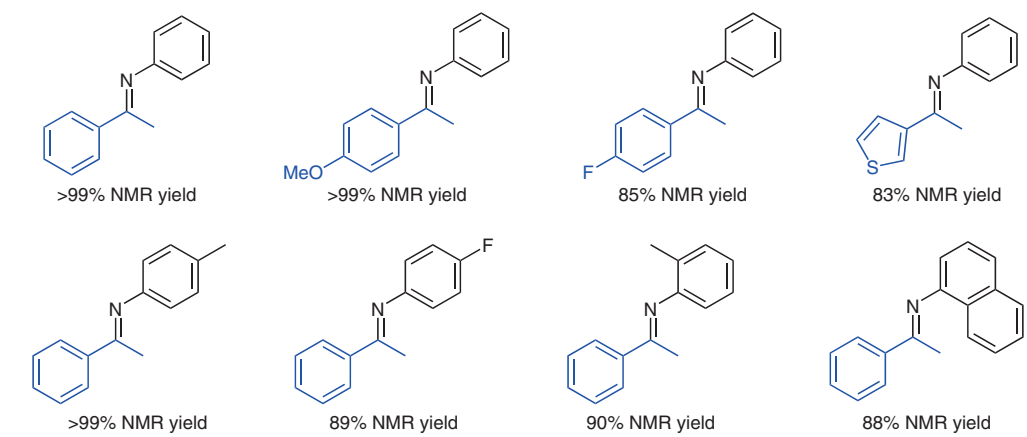
J. Am. Chem. Soc. **2022**, *144*, 10844–10853, DOI: 10.1021/jacs.2c02669.

Hydroamination of Arylacetylenes by Gold Nanoclusters Immobilized on Carbon





Selected examples:



Significance: An N-heterocyclic-carbene-stabilized gold nanocluster $[Au_{16}(NHC\text{-}1)_5(PA)_3Br_2]^{3+}$ (Au_{16} cluster) immobilized on carbon (**Au_{16}/XC-72**) was prepared according to Equation 1. **Au_{16}/XC-72** catalyzed the hydroamination of arylacetylenes with anilines to give the corresponding ketimines in up to >99% NMR yield (eq. 2).

Comment: The Au_{16} cluster was characterized by means of XRD, ^{1}H NMR, ^{13}C NMR, HRESI-MS, UV/Vis, DPV, XANES, EXAFS, and IR analyses. **Au_{16}/XC-72** had similar XANES, EXAFS, and IR profiles to a Au_{16} cluster. The reaction of phenylacetylene with aniline catalyzed by 0.002 mol% of **Au_{16}/XC-72** proceeded with a high turnover number of 50,000.

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Synfacts 2022, 18(10), 1121 Published online: 20.09.2022
DOI: 10.1055/s-0041-1738695; **Reg-No.:** Y08122SF

Category

Polymer-Supported Synthesis

Key words

gold catalysis
N-heterocyclic carbenes
hydroamination
phenylacetylenes
anilines

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