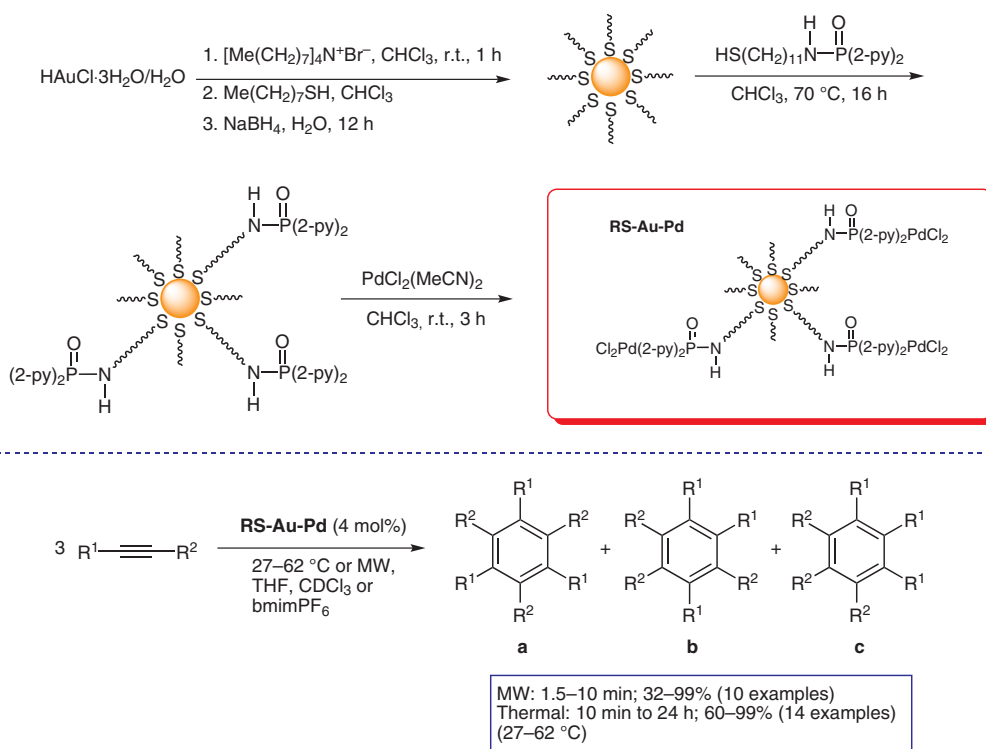


Recyclable Au Nanoparticle Supported Palladium(II) Catalyst



Significance: A gold nanoparticle supported Pd(II) complex was prepared and used in catalytic alkyne cyclotrimerization. Thiolate-stabilized Au nanoparticles were treated with dipyriddyalkylthiol and the resulting Au-anchored dipyriddy groups coordinated with Pd(II) in a chelating fashion to afford a gold nanoparticle supported Pd(II) complex (RS-Au-Pd). RS-Au-Pd was a highly effective catalyst for the [2+2+2] cyclotrimerization of alkynes under microwave (MW) or thermal conditions to give the corresponding benzenes in 32–99% yield.

Comment: All the microwave-assisted alkyne cyclotrimerization reactions were completed within 1–10 minutes, whereas thermal conditions took 10 minutes to 24 hours under otherwise the same conditions. The catalyst was readily separated and quantitatively recovered from the reaction mixture by simple centrifugation and filtration. The recovered catalyst was reused eight times with slight loss of catalytic activity (cyclotrimerization of 3-hexyne; yield; 1st use: >99%, 5th use: 90%, 9th use: 57%).