Stille Coupling Catalyzed by Gold Nanoparticles Formed In Situ on Active Carbon

Significance: Activated-carbon-adsorbed gold nanoparticles formed in situ catalyzed the C(sp³)–C(sp³) coupling reaction of benzylic bromides with allyl(tributyl)stannanes to give the corresponding homoallylic benzenes in up to >99% yield (eq. 1). This catalyst was also applicable on an allyl–allyl coupling reaction to furnish 1,5-dienes in yields of 54–59% (eq. 2).

Comment: The coupling of (2-bromoethyl)benzene with allyl(tributyl)stannane proceeded in the presence of a 0.001 mol% loading of the gold nanoparticles to give the coupling product in 29% yield with a total turnover number of up to 29000. The catalyst was recovered by centrifugation and recycled four times without a loss of its catalytic activity.