



Recyclable Pd(0)-Pd(II) composites formed from Pd(II) dimers with NHC ligands under Suzuki-Miyaura conditions.

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Streszczenie

Dimeric complexes of the type $[\text{Pd}(\mu\text{-X})\text{X}(\text{NHC})]_2$ were employed in the Suzuki–Miyaura cross-coupling leading to 2-methylbiphenyl. The excellent activity of the studied dimers is perfectly illustrated by a TOF of up to 10^6 h^{-1} . Mechanistic investigations with the application of TEM, XPS, and mercury poisoning tests provided an insight into the nature of the catalytic process. Accordingly, the reduction of the dimeric palladium complex $[\text{Pd}(\mu\text{-X})\text{X}(\text{NHC})]_2$ resulted in the formation of a composite containing Pd(0) nanoparticles protected by a layer of a Pd(II) species such as anions $[\text{PdBr}_4]^{2-}$ or $[\text{PdBr}_3(\text{NHC})]^-$. The *in situ* formation of Pd(0)–Pd(II) composites resulted in the high stability of the catalytic system, which was active in ten subsequent recycles without any additional protection.

Słowa kluczowe

nanoparticles, N-heterocyclic carbene, palladium, Suzuki-Miyaura reaction

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