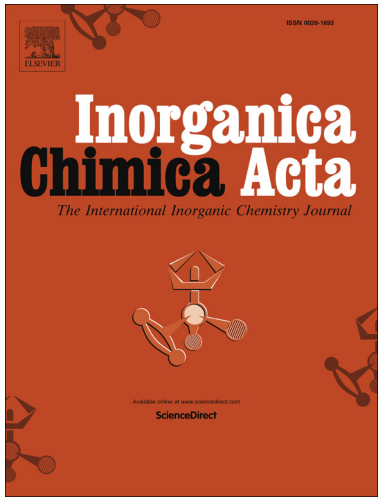

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Abstract

Reactivity of 4-toluidine (**2**) and 4,5-dimethylbenzene-1,2-diamine (**3**) were compared in coupling with the palladium-*bis*(isocyanide) complex *cis*-[$PdCl_2(CNXyl)_2$] (Xyl = 2,6-$Me_2C_6H_3$, **1**), mixed isocyanide/diaminocarbene species *cis*-[$PdCl_2(CNXyl)\{C(NHXyl)=NH(4\text{-}C_6H_4CH_3)\}$] (**4**), and *cis*-[$PdCl(CNXyl)\{\underline{C}(NHXyl)=NHC_6H_2(Me)_2\underline{N}H_2\}$]Cl (**5**). In these Pd(II)-mediated reactions, 4,5-dimethylbenzene-1,2-diamine (**3**) was significantly more reactive than 4-toluidine (**2**), leading to the first mixed *bis*(diaminocarbene) complex *cis*-[$PdCl\{\underline{C}(NHR)=NHC_6H_2X_2\underline{N}H_2\}\{C(NHXyl)=NH(4\text{-}C_6H_4CH_3)\}$]Cl (**6**) containing two different diaminocarbene ligands. Complex **6** was isolated and characterized by elemental analyses (C, H, N), HRESI$^+$-MS, IR, ^{1}H and $^{13}C\{^1H\}$ NMR spectroscopies, and single-crystal X-ray diffraction.