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A Novel Water-Soluble NHC-Pd Polymer: An Efficient and Recyclable Catalyst for the Suzuki Coupling of Aryl Chlorides in Water at Room Temperature


Suzuki–Miyaura Coupling in Water Using an NHC-Pd Polymer

Significance: A water-soluble NHC-Pd polymer 3 was prepared by the reaction of 1 with TEG-Br in the presence of NaH followed by treatment with Pd(OAc)₂ (eq. 1). The NHC-Pd polymer 3 catalyzed the Suzuki–Miyaura coupling of aryl bromides or aryl chlorides with arylboronic acids in water to give the corresponding biaryls in 69-93% yield (21 examples, eq. 2).

Comment: GPC analysis revealed that the average molecular weight of the NHC-Pd polymer 3 was around 107000 Da. After the reaction of 4-chlorobenzaldehyde with phenylboronic acid, the product was extracted with n-hexane and the resulting aqueous solution containing 3 was subjected to the recycling runs.