

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

Category

Polymer-Supported Synthesis

Key words

water

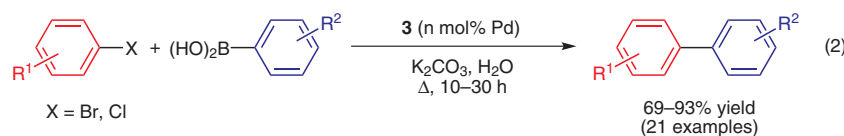
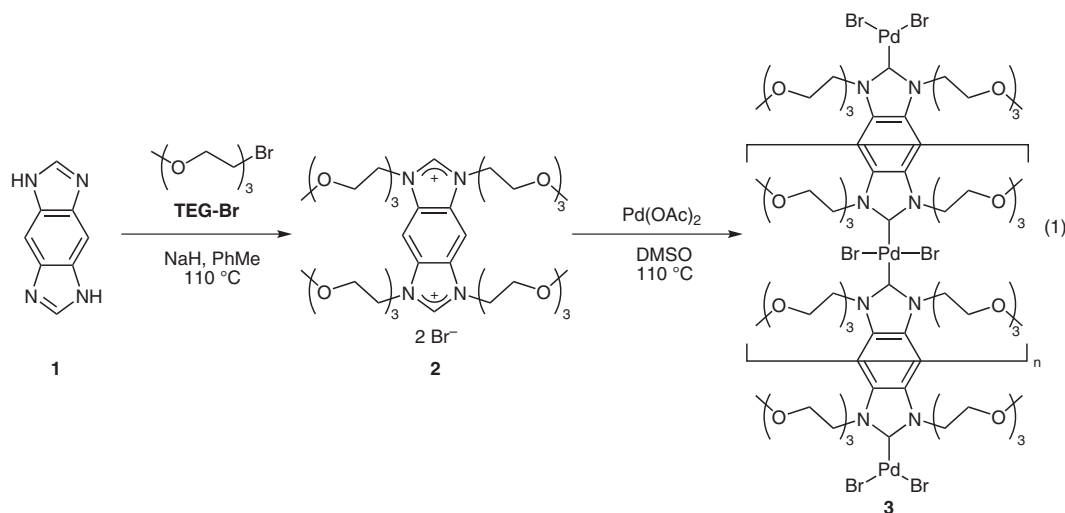
NHC-Pd polymer

Suzuki–Miyaura coupling

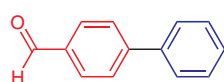
aryl halides

arylboronic acids

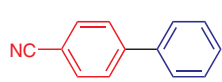
**SYNFACT**  
of the month



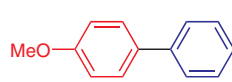
## Typical results:



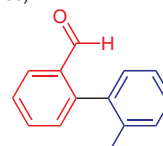
90% yield  
X = Br, n = 0.005, r.t., 11 h  
90% yield  
X = Cl, n = 0.05, r.t., 24 h



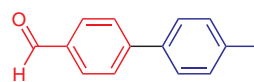
91% yield  
X = Br, n = 0.005, r.t., 14 h  
88% yield  
X = Cl, n = 0.05, r.t., 24 h



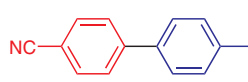
88% yield  
X = Br, n = 0.05, r.t., 18 h  
74% yield  
X = Cl, n = 0.1, r.t., 30 h



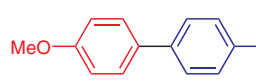
81% yield  
X = Br, n = 0.05, 80 °C, 24 h  
70% yield  
X = Cl, n = 0.1, 80 °C, 30 h



93% yield  
X = Cl, n = 0.05, r.t., 24 h



90% yield  
X = Cl, n = 0.05, r.t., 24 h



78% yield  
X = Cl, n = 0.1, r.t., 30 h

**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)<sub>2</sub> (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).

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**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.