Polymeric Imidazole Pd Catalyst for Cross-Couplings

**Preparation of an imidazole palladium catalyst (MEPI-Pd 3):**

\[
\text{(2 mol equiv imidazole)} + (\text{NH}_4)_2\text{PdCl}_4 \quad (1 \text{ mol equiv Pd}) \rightarrow \text{MEPI-Pd 3} \quad (M = \text{PdCl}_2 \text{ and } \text{Pd}^0)
\]

**Significance:** A self-assembled polymeric palladium catalyst MEPI-Pd 3 was prepared via the molecular convolution of (NH₄)₂PdCl₄ and poly[[N-vinylimidazole]-co-[N-isopropylacrylamide]₅]. MEPI-Pd 3 (0.8–40 mol ppm Pd) promoted the allylic arylation/alkenylation of allylic esters 4 with aryl/alkenylboron reagents 5 in water and/or alcohol to give the corresponding products 6. MEPI-Pd 3 (0.28 mol ppm) drove the Suzuki–Miyaura coupling of a variety of aryl chlorides, bromides, and iodides in water to give the corresponding biaryls 7.

**Comment:** MEPI-Pd 3 was reused without loss of catalytic activity for the allylic arylation and the Suzuki–Miyaura coupling. MEPI-Pd with 0.28 mol ppm Pd efficiently promoted the Suzuki–Miyaura coupling of iodotoluene and phenylboronic acid to afford 7b quantitatively with a TON of 3,570,000 and a TOF of 119,000 h⁻¹. The authors reported a preliminary communication for the allylic arylation of allylic acetates (Angew. Chem. Int. Ed. 2011, 50, 9437; Synfacts 2011, 1380).