

## عنوان مقاله:

Main-Chain N-Heterocyclic Carbene Palladium Polymers as Highly Stable and Recyclable Self-Supported Nanoreactors in the Suzuki-Miyaura Coupling of Aryl Chlorides in Water

## محل انتشار:

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## خلاصه مقاله:

Over the past decades, transition – metal – catalyzed cross – coupling methods, the most popular of which is the Suzuki – Miyara coupling have been successfully employed for the synthesis of biaryl compound [1]. Biaryl motifs are widely represented in organic molecules with important biological or physical properties. Some of the challenges associated with cross-coupling reactions have focused on the use of unreactive aryl chlorides as coupling partners in view of their attractive cost and readily available diversity [2]. Among the plethora of ligands developed for this purpose, bulky electron-rich phosphorus, and palladacycles have met with great success. In particular, N-heterocyclic carbenes (NHCs) have received increasing attention as possible alternative ligand for the widely used, air sensitive phosphine ligands in Pd-catalyzed cross-coupling reactions [3]. NHC ligands have higher donor capability and basicity than phosphine and nitrogen donor ligands, forming strong metal carbene bonds, and they demonstrate less labile properties than phosphine and N-donor ligands, exhibiting a slow dissociation rate. Other advantages of NHC ligands are their low prices and easy manipulations compared with tertiary phosphines, and usually no excess of the ligands is necessary during the catalytic reactions [4]. Very recently, Bielawski and co-workers have introduced a new attractive generation of highly stable main-chain NHC-based organometallic polymers (NHC-MCOPs) [5], through the direct reaction of bis(azolium)compounds with stoichiometric amounts of Pd(II) or Pt(II) salts. Amongst the key feature of these organic – inorganic hybrid materials is their high stability against hydrolysis and thermal decomposition (up to 300 °C), and their tunable electronic and chemical properties. Furthermore, due to the fact that NHC-MCOPs are composed of regular arrays of NHC-metal complexes in their polymeric backbone, they might be able to simulate the high catalytic activities of homogeneous NHC – transition metal complexes, and at the same time they could have the advantages of heterogeneous catalysts such as high durability and easy separation and recovery of the catalyst from the reaction mixture. However, to our knowledge there is no report on the application of NHC-MCOP as catalyst in chemical transformation. Along the line of this hypothesis, herein, we wish to explore for the first time that NHC-Pd-MCOP 1 is a highly efficient and reusable catalyst for the Suzuki-Miyaura coupling of a variety of aryl halides in water.

## کلمات کلیدی:

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