

6th International Conference on
Organic & Inorganic Chemistry

August 08-09, 2019 | Amsterdam, Netherlands

Catalytic activities in the Suzuki-Miyaura cross-coupling reaction of unsymmetrical substituted benzimidazolium salts and their palladium complexes

For the formation of C-C bonds in the midst of the organoboron compounds and organic halides, Pd-catalyzed Suzuki-Miyaura cross-coupling reaction is a very important method. The aryl chlorides have usually been used as substrates for this reaction due to practical and economic reasons. A series of unsymmetrical substituted new benzimidazolium salts and their PEPSI type palladium complexes, which have become popular in recent years, were synthesized in order to improve more reactive catalysts. For the synthesis of salts, firstly, 1-alkylbenzimidazole was prepared from benzimidazole (1 mmol), alkyl chloride (1 mmol) and potassium hydroxide (1 mmol) in ethyl alcohol (60 mL). Alkyl halide (1 mmol) was added to a solution of DMF containing 1-alkylbenzimidazole (1 mmol) and the reaction mixture was refluxed for 24 h. On the other hand, PEPSI type Pd-NHC complexes were prepared from PdCl₂ (1 mmol), benzimidazolium salts (1 mmol) and K₂CO₃ (5 mmol) in 3-chloropyridine (3 mL). The structures of all compounds were characterized by suitable spectroscopic and analytic methods. All compounds were tested as catalysts in Suzuki-Miyaura reaction, which was done using following reagents; organoborane derivatives, aryl halides, synthesized compounds, base and DMF/H₂O. The reaction mixture was sustained at different temperatures and times for obtaining optimum conditions. According to the obtained results, they especially were quite effective in the coupling of 4-chlorotoluene with 4-tertbutylphenylboronic acid.

Biography

Senem Akkoç has obtained her Bachelor's Degree from Bülent Ecevit (Zonguldak Karaelmas) University in 2009. She has completed her Master's degree in the synthesis and properties of N-heterocyclic salts at the Inonu University in 2012. She has completed her PhD from Erciyes University about in-vitro cytotoxic activity of synthesized benzimidazolium salts. She had been in the University of Sydney (Australia) as a Visiting Scholar from 2015 to 2016. She has published more than 30 papers in reputed journals.

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