



Arylation of Phenol and Suzuki Miyaura Coupling Catalyzed by Pd(II) Complexes of Bulky Organochalcogen (S/Se) Ligands

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Abstract:

Two novel bulky ligands L1 and L2 containing an imine functionality and a chalcogen donor atom have been synthesized and characterized using ^1H and ^{13}C NMR techniques. The Pd(II) complexes 1 and 2 of both the ligands L1 and L2 respectively were prepared and their structures were elucidated by single crystal X ray diffraction. It was observed that both the Pd(II) complexes exhibit nearly square planar geometry and palladium is bound to the ligand in a bidentate fashion. The Pd(II) complexes 1 and 2 have been explored as potential catalysts in $\text{C}\text{--}\text{O}$ cross coupling of phenol with various aryl halides. Both the complexes proved their efficiency in the catalyzing $\text{O}\text{--}\text{ary}$ lation reactions as reactions occurred in shorter reaction time, at low temperatures and at low loading of catalyst. A considerably high TON of 990 (TOF 310 s^{-1}) has been reported by complex 2. The role of chalcogen donor atom in perturbing the efficiency of the catalyst has also been studied. The Pd(II) complexes were also investigated in catalyzing Suzuki Miyaura cross coupling reaction and it was noticed that moderate to good conversions resulted in short time duration at 0.01 mol% catalyst loading.

Biography:

Aayushi Arora is a research scholar currently pursuing her doctorate in Chemistry under the guidance of Dr. Arun Kumar at Department of Chemistry, Doon University, Dehradun, India. Her research work includes designing of chalcogen ligated molecular and nano catalytic systems for various chemical reactions such as $\text{C}\text{--}\text{C}$, $\text{C}\text{--}\text{O}$, $\text{C}\text{--}\text{N}$



cross-coupling reactions and reduction of nitroarenes. In addition, she is also involved in designing fluorescent probes containing Ru(II) polypyridyl unit for the detection of metal ions and sensing applications by host guest interaction.

Publication of speakers:

1. Sharma AK, Joshi H, Bhaskar R, Kumar S, Singh AK, Dalton Transactions 2017; 46(8): 2485–2496.
2. Mullick K, Biswas S, Kim C, Ramprasad R, Angeles-Boza AM, Suib SL, Inorganic Chemistry 2017; 56(17); 10290–10297.
3. Arora, P. Oswal, G. K. Rao, J. Kaushal, S. Kumar, A. K. Singh and A. Kumar, Chemistry Select, 2019, 4, 10765.
4. Kumar, G. K. Rao, S. Kumar and A. K. Singh, Dalton Trans., 2013, 42, 5200.
5. G. K. Rao, A. Kumar, M. P. Singh and A. K. Singh, J. Organomet. Chem., 2014, 7491.

Frontiers in Catalysis and Chemical Engineering, Amsterdam, March 23-24, 2020

Citation: Aayushi Arora; $\text{O}\text{--}\text{ary}$ lation of Phenol and Suzuki Miyaura Coupling Catalyzed by Pd(II) Complexes of Bulky Organochalcogen (S/Se) Ligands Euro Catalysis 2020; March 23, 2020; Amsterdam, Netherlands.