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SYNTHESIS OF PYRIDINE BASED PINCER LIGAND METAL SYSTEM AND THEIR APPLICATIONS IN COUPLING REACTIONS AND BIOACTIVITY

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ABSTRACT

This investigation demonstrated that fundamental properties of N-heterocyclic indolyl ligands can be characterized by examining two Py-Py-IndH reactions, two Py-Pz-IndH reactions, two Py-7-Py-IndH reactions, and two Ox-7-Py-IndH reactions (L1H-L5) [1].

A ligand which was tridentate, synthesized by coupling of Stille using 2,8-dibromoquinoline and 2-(tritylstannyl) pyridine, then cross-coupled to HPPH2. NMR, elemental analysis, high-resolution mass spectrometry, and cyclic characteristics were used to characterize the synthesized system. Under all synthetic conditions explored, the developing of bi-chelated metal was favored over mono-chelated system [1][3]. In a study of electrocatalytic carbon dioxide reduction, the cobalt complex was found to be most efficient in converting CO₂ to CO over a water solution include a proton source [2].

The ligands are elevated to levels of palladium system 1-5 on the presence of one equivalent of palladium acetate. The elemental analysis and NMR spectroscopy of all the ligand precursors and palladium system were carried out on all of them. Single crystal X-ray diffraction techniques were used to determine the shape of the molecules in system 3 and 5. Aryl halide Suzuki reactions were studied with palladium system 1 to 5.

Keywords: pyridine, tritylstannyl, NMR spectroscopy, Aryl halide, palladium system; N-heterocyclic; indolyl; Suzuki reaction

Introduction

Over the course of decades, various coupling products have been formed by transition metal-catalyzed cross coupling reactions [1-3]. The Nobel Prize for Chemistry in 2010 was given to cross coupling due to its well-developed and applications in different methods. Recent progress have led to the progress of a number of palladium pincer system for cross coupling reactions [6, 7]. The discovery of pincer ligands in palladium system has led us to consider applying them to cross-coupling reaction systems. In addition to the work we have performed regarding the production of metal system include the indole ring system [8-9], others have reported success with this approach [10-12], so we are eager to learn whether the indole ring system has been introduced into the pincer ligand precursors.

With this paper, we are going to introduce N-heterocyclic substituents, like, pyridine, oxazoline or pyrazole into the indole ligand at various positions so as to enhance the pendant functionality of the ligands [5][7]. A combination of pyridine, pyrazole, or oxazoline, and a carboxylic acid group should be able to provide the precursors for ligands. There will be described the palladium system that