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Synthesis, X-ray structural and catalytic activity of new asymmetric palladacycle complexes with bidentate (P,P- and P,O) ligands

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One of the most important research areas in the organometallic chemistry is C-H bond activation in cyclopalladated complexes [1, 2]. Palladacycles have been known over 30 years [3] and have gained great interest due to their applications in many areas including organic synthesis [4]. The interest in cyclopalladated complexes derived from *N*-donor ligands has increased considerably and it is due to their extremely high catalytic activity in a variety of important C–C coupling reactions [5]. This work reports the preparation of the mononuclear derivatives $[(K^2\text{-}C_6H_4CH_2NH_2)Pd(K^2\text{-}\mathbf{L})](ClO_4)$ (**L** = dppp and dppmo). The results of these studies including the full characterization of the obtained complexes (performed by X-ray structural, IR, multinuclear NMR techniques and also application of the new asymmetric cyclopalladated of benzylamine as a catalyst precursor for the Suzuki reaction) is presented and discussed in this paper. The palladacycle complexes proved to be excellent catalysts for the Suzuki reactions of various aryl halides. Therefore, in order to examine the catalytic activity of Pd(II) complexes in the Suzuki reaction, the reaction between bromobenzene with phenylboronic acid in the presence of catalyst Pd was chosen as model reaction. Influences of different parameters such as base, temperature, solvent, and catalyst concentration have examined to obtain the best possible combination.

Keywords: Synthesis, palladacycle complexe, X-ray structure, bidentate ligands, Suzuki coupling

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