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Application of a Series of New Platinum Organometallic Complexes Derived from Bidentate Schiff Base Ligands in the Hydrogenative and Dehydrogenative Silylation of Styrene

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Abstract : The application of inorganic chemistry to catalysis and environmental chemistry is a rapidly developing field, and novel catalytic metal complexes are now having an impact on the industrial development practice. Advances in organometallic chemistry are crucial for improving the design of compounds to reduce toxic side effects and understand their mechanisms of action. The reaction of platinum(II) organometallic complexes with bidentate Schiff bases derived from 2-Hydroxynaphtalydeneaniline have been carried out. It concerns N,N'-naphtalidene para-nitroaniline (1-a), the, the N,N'-naphtalidene para-ethoxyaniline (1-b), the N,N'-naphtalideneaniline (1-c), the N,N'-naphtalidene para-chloroaniline (1-d) and the N,N'-naphtalidene para-methoxyaniline (1-e). The ligands were fully characterized by I.R., elemental analysis, 1H-NMR, 13C-NMR, ESI Mass Spectrometry and X-Ray Diffraction. The resulting metal complexes were obtained as a cationic species, through a simple substitution reaction, leading to two geometric isomers [1, 2], and characterized by IR, 1H-NMR, 13C-NMR, LIFDI Mass Spectrometry and supported by Elemental Analysis and X-Ray diffraction. Furthermore, a bimetallic platinum complex was prepared from the same ligands and dichloro(1,5-cyclooctadiene)platinum and characterized by X-Ray diffraction [3]The catalytic properties of the prepared platinum complexes in the hydrogenative and dehydrogenative silylation of styrene were investigated, and reaction kinetics conversion to products was determined by 1H-NMR and confirmed by GC-MS. This presentation will detail a comparison of the catalytic activity of five platinum organometallic complexes bearing different Schiff base ligands in the hydrosilylation of styrene, varying the experimental conditions of temperature, nature of the complex and the loading of the catalyst.

Keywords : catalysis, hydrosilylation, organometallic, schiff base
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