

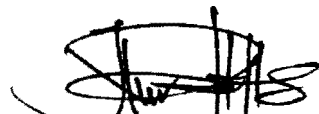
THE CATALYTIC ACTIVITY OF PALLADIUM(II)-1,3-BIS[4-NITROPHENYL)METHYL]-1-BENZIMIDAZOLIUM BROMIDE COMPLEXES IN HECK REACTION

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ABSTRACT

THE CATALYTIC ACTIVITY OF PALLADIUM(II)-1,3-BIS[(4-NITROPHENYL)METHYL]-1-BENZIMIDAZOLIUM BROMIDE COMPLEXES IN HECK REACTION

N-heterocyclic carbene ligand is used to synthesize palladium(II) complex which involves in Heck reaction as catalyst. In this study, the 1,3-bis[(4-nitrophenyl)methyl]-1-benzimidazolium bromide which is one of *N*-heterocyclic carbene (NHC) ligand had been successfully synthesized with reaction between benzimidazole and 1,4-nitrobenzyl bromide. The percentage yield of the ligand and complex had been calculated which is 84.21 % and 17.05% respectively. The compound of 1,3-bis[(4-nitrophenyl)methyl]-1-benzimidazolium bromide and palladium(II)-1,3-bis[(4-nitrophenyl)methyl]-1-benzimidazolium bromide complex were characterized by using Fourier Transfer Infrared (FTIR) and Nuclear Magnetic Resonance (NMR). The palladium(II)-1,3-bis[(4-nitrophenyl)methyl]-1-benzimidazolium bromide have been used as homogeneous catalyst which improves the catalytic activity in Heck reaction. The catalytic activity of complex was evaluated in Heck reaction. In Heck reaction, the synthesized complex was tested in the reaction between 1-bromo-4-nitrobenzene and styrene to produce 3-(4-nitrophenyl)-benzene. Besides, by using sodium carbonate, Na₂CO₃ as a base, the effect of the catalyst loading had been studied by changing the percentage of catalyst loading. Also, the reaction that had been monitored every 15 minutes which until 60 minutes is to study the effect of time for the production of product obtained from Gas Chromatography (GC) analysis. Therefore, the optimum condition for catalytic testing is 1.0 mmol%, 46.55 TON and 46.55% conversion rate at 45th minutes.