

Synthesis and Characterization of Chitosan Schiff Base Supported Pd(II) Catalyst and Its Application in Suzuki Coupling Reactions

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Abstract : Palladium-catalyzed Suzuki coupling reactions are powerful ways for synthesis of biaryls compounds and so far different palladium sources as have been used in catalyst systems. However, the high cost of the ligands using as support materials for palladium ion and so researchers have explored alternative low-cost support materials such as silica, cellulose and zeolite. A natural polymer chitosan is suitable for support material because of its unique properties such as eco-friendly, renewable, abundant, low cost, biodegradable and it has free reactive -NH₂ and -OH groups. Especially, pendant amino groups of chitosan can easily react with carbonyl groups of aldehyde or ketone by Schiff base formation and thus palladium ions can coordinate with imine groups of Schiff base. This purpose, in this study, firstly a new chitosan Schiff base supported palladium (II) catalyst was synthesized and its chemical structure was characterized with FT-IR, SEM/EDAX, XRD, TG-DTG, ICP-OES and magnetic moment techniques. Then catalytic performance of the catalyst was investigated in Suzuki cross coupling reactions under simple and fast microwave heating methods. Also, recycle activity of palladium catalyst was tested under optimum condition and the catalyst showed long life time. At the end of catalytic performance tests of chitosan supported palladium (II) catalysts indicated high turnover numbers, turnover frequency and selectivity with very small loading catalyst

Keywords : catalyst, chitosan, Schiff base, Suzuki coupling

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