

Highly-active Pd-complexed Graphene Oxide Catalyst for Cross-Coupling Reactions in Aqueous Phase

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Catalysts are useful tools for the various chemical processes including synthesis and conversion. Generally, heterogeneous catalysts are more advantageous in separation from products and reusability than homogeneous catalysts. Here, we report that a highly active Pd-complexed graphene oxide (GO/NHC-Pd) catalyst for several kinds of cross coupling in aqueous phase. To prepare the Pd-complexed GO catalysts, bulky n-heterocyclic carbene-silane precursor was synthesized and combined with GO. They were characterized by SEM, EDS, ICP-OES and FT-IR. This complex was participated in cross coupling reaction in aqueous phase instead of organic solvent. Thereafter, this simple and highly-active catalyst was evaluated by Suzuki C-C coupling and Heck C-C coupling which produce the biphenyl compounds in aqueous phase. Cross coupling of Suzuki and Heck reaction showed generally good yield while Sonogashira reaction was relatively challengeable. Reusability is also confirmed by performing consequent cross coupling reactions in five times.