

The role of polyphenylene support in heterogeneous catalysis

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A major goal in catalysis is to combine the advantages of molecular catalysts and heterogeneous processes, ideally maintaining—or even improving—the reactivity and selectivity of the molecular catalysts, while facilitating product recovery and catalyst recycling. Here, we describe a solid polyphenylene support that serves as an excellent platform for metal-catalyzed reactions that are normally carried out under homogeneous conditions. Polyphenylene consists of biphenyl groups that serve as ligand to stabilize the transition state of Suzuki cross coupling reactions, such as coupling 1,3-dimethyl-2-chlorobenzene with 2-tolylboronic acid. This reaction could only be carried out under homogeneous conditions previously. Polyphenylene also shows high thermal stability in air due to its aromatic backbone, further enabling the partial oxidation of benzyl alcohol to benzaldehyde in gas phase continuous mode.

