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A highly recoverable polymer-supported ionic salen-palladium complex as a catalyst for the Suzuki-Miyaura cross coupling in neat water

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9
10 **Abstract**

11 A polymer supported Pd-salen complex (PS-Pd-salen) was synthesized and characterized
12 by Fourier transform infrared spectroscopy (FT-IR), Fourier-transform NMR
13 spectroscopy (FT-NMR), thermal gravimetric analysis (TGA), scanning electron
14 microscopy (SEM), energy-dispersive X-ray spectroscopy (EDX), surface area and pore
15 size distribution by Brunauer-Emmett-Teller (BET). The heterogeneous catalytic
16 performance of the PS-Pd-salen for the Suzuki-Miyaura coupling of variety of phenyl
17 boronic acid with different aryl halides was successfully conducted in water with K_2CO_3
18 and 20 mg catalyst loading at room temperature. The coupling reactions with aryl iodides
19 and bromides were achieved at room temperature with good to excellent yield; whereas
20 the reactions with aryl chlorides were performed in aqueous-ethanol (1:1) at 90 °C. The
21 product yields related with the substrates were optimized, and main reaction factors
22 influencing the yields were also recognized. The results clearly indicated that the reaction
23 constraints needed to achieve high yields are substrate-reliant. The hot filtration test
24 verified heterogeneous nature of PS-Pd-salen complex. Moreover, the catalyst showed
25 excellent reusability for five successive runs in slight compromising with its activity.

26
27 **Keywords:** PS-Pd-salen; Heterogeneous catalysis; Suzuki cross-coupling reaction; Water.

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