

Tandem catalysis by in-situ generated microporous COF–Pd nanoparticle hybrids

Mohitosh Bhadra¹, Rahul Banerjee¹

¹Physical And Material Chemistry Division, CSIR-NCL, Pune, India

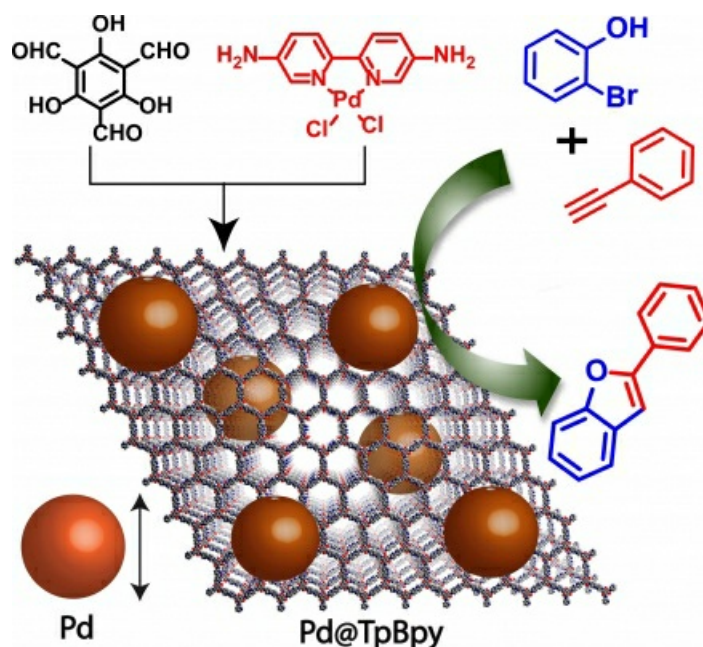
E-mail: mohitosh.bhadra@gmail.com

The development of nanoparticle-polymer hybrid based heterogeneous catalysts with high reactivity and good recyclability is highly desired for their applications in chemical and pharmaceutical industries. Herein, we have developed a novel synthetic strategy by choosing predesigned metal anchored building block for in situ generation of metal (Pd) nanoparticles in the stable, porous and crystalline covalent organic framework (COF), without using conventional reducing agents. In situ generation of Pd nanoparticles in COF skeleton is explicitly confirmed from PXRD, XPS, TEM images, and ¹⁵N NMR spectral analysis. This hybrid material is found to be an excellent reusable heterogeneous catalyst for the synthesis of biologically and pharmaceutically important 2-substituted benzofurans from 2-bromophenols and terminal alkynes via tandem process with TON up to 1101. The heterogeneity of the catalytic process is unambiguously verified by mercury poisoning experiment and leaching test. This hybrid material shows superior catalytic performance compared to commercially available homogeneous as well as heterogeneous Pd catalysts.

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Keywords: [covalent organic frameworks](#), [Pd nanoparticles](#), [tandem catalysis](#)