

Tapping electronic properties of amide-porous polymer to promote selective-oxidation reactions

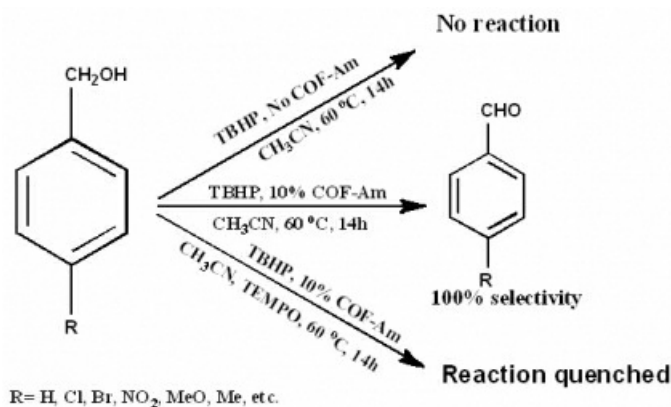
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Covalent organic framework materials are crystalline polymers with periodic ordering of organic building blocks and/or linkers exhibit wonderful applications in gas storage, conductive materials, energy storage and conversion, and to promote catalysis [1-3]. We report here the synthesis of a novel porous polymer framework with [3+2] structure motif via the condensation of 1,3,5-benzenetricarbonyl trichloride and p-phenylenediamine and characterized by FT-IR, TGA, PXRD, BET, SEM, TEM, ¹³C-CPMAS etc. The resulting highly stable mesoporous 2D framework material exhibits continuous conjugation of π -electronic system confirmed by solid state UV-Vis DR spectroscopy. Apart from gas adsorption properties, this material shows remarkable catalytic activity manifested by extremely low band gap of the conjugated π -cloud. The reaction pathway of benzyl alcohols via the formation of free radicals to only the corresponding aldehydes is highly selective supported by calculations on Dmol3 and Gaussian09 platforms. This is one of the rare cases of any organic polymer material acting as an outstanding organic catalyst with no metal add-ons.

[1] Côté, A. P. et al. (2005). Science. 310, 1166–1170.

[2] Shinde, D. B. et al. Chem. Commun. 2015, 51, 310–313.

[3] Khatioda, R. et al. communicated 2017.



Scheme: Representation of selective oxidation of substituted benzylalcohols to the corresponding benzaldehydes.

Keywords: [Porous organic materials](#), [Band gap](#), [Catalysis](#)