

B-N-codoped 3D porous carbon as efficient catalyst for 4-nitrophenol reduction to 4-aminophenol

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The heteroatom dopants into nanocarbons have widely investigated in many applications, such as catalysis [1]. Recently, co-doping multi elements into carbon framework has emerged as a new route to create new features or synergetic effect for enhancing catalytic performance [2-4]. Here, we report the first boron- and nitrogen-co-doped into 3D porous carbon (B-NPC) as efficient metal-free catalyst for 4-nitrophenol reaction into 4-aminophenol. It is found that the resistance of N-doped porous carbon (NPC) have significantly decreased in the presence of atomic boron dopant, which lead to increased catalytic reduction of 4-NP. The reaction rate constant observed to be $1.4 \times 10^{-4} \text{ s}^{-1}$ and $22 \times 10^{-4} \text{ s}^{-1}$ at NPC and B-NPC, respectively. The catalyst shown a good recyclability and reusability, which run fifth time without decreasing catalytic activity. This work has contributed to development of using carbon-based materials for catalytic process as a unexpensive and co-friendly environment catalyst.

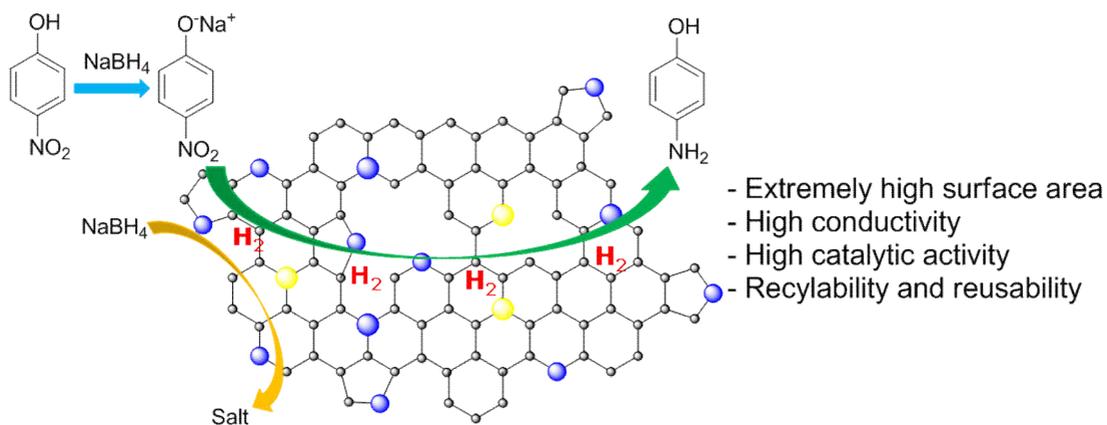


Figure 1: Schematic catalytic 4-NP reduction into 4-AM using B-N-codoped 3D porous carbon as metal-free catalyst; nitrogen (blue), boron (yellow), carbon (black).

References:

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