Supporting information

Bio-inspired Nanozyme: Hydratase Mimic in Zeolitic Imidazolate Framework

Jinxing Chen,1, 2 Liang Huang,1, 2 Qingqing Wang,1 Weiwei Wu,1, 2 He Zhang,1, 2 Youxing Fang* 1 and Shaojun Dong* 1, 2

1 State Key Laboratory of Electroanalytical Chemistry, Changchun Institute of Applied Chemistry, Chinese Academy of Sciences, Changchun, Jilin 130022, PR China

2 University of Science and Technology of China, Hefei, Anhui 230026, PR China

*Corresponding Author. Tel: +86 431 85692886. Fax: +86 431 85689711.

E-mail: fangyx@ciac.ac.cn, dongsj@ciac.ac.cn
Figure s1. DRIFTS spectrum of ZIF-8 with different sizes.
Figure s2. TEM images, SEM images and size distribution histograms of ZIF-8 nanoparticles with different sizes.
Figure s3. XRD patterns of the as-prepared ZIF-8 with different sizes.
Figure s4. UV-vis spectra of pNPA with or without the addition of ZIF-8.

Figure s5. The TEM image of the re-dispersed ZIF-8 (30 nm) nanoparticles.
Figure s6. (a) Time-dependent absorbance of pNPA solutions in the presence of different catalysts. (b) Initial hydrolysis rate ($V_0$) of pNPA in the presence of different catalysts.

Figure s7. Time dependent absorbance of pNPA hydrolysis in the presence of different catalysts.
Figure s8. TEM images of ZIF(700) at different magnifications.

Figure s9. Time-dependent absorbance of pNPA solutions with ZIF-8 catalysts calcined at different temperatures.
Figure s10. (a) Photographs of ZIF-8, ZIF(300), ZIF(500) and ZIF(700). (b) Photographs of hydrolysis products catalysis by ZIF-8, ZIF(300), ZIF(500), and ZIF(700) (from left to right ending with a blank sample).

Figure s11. XRD patterns of ZIF-8, ZIF(300), ZIF(500) and ZIF(700)
Figure s12. UV-vis spectra of $p$NP in PBS buffer with different pH values.

Figure s13. Inhibition of $p$NPA hydrolysis by acetate.
Figure s14. (a) Time dependent absorbance of \( p \)NPA hydrolysis in the presence of different doses of ZIF-8. (b) Time dependent absorbance of \( p \)NPA hydrolysis with different initial concentrations of \( p \)NPA.

Figure s15. Reusability of ZIF-8 for \( p \)NPA hydrolysis reaction.
Figure s16. XRD patterns of ZIF-8 after recycling used.

Figure s17. Schematic illustration of the AChE activity determination use Ellman method.
Figure s18. Absorbance spectra of 5-thio-2- nitrobenzoate upon hydrolysis of ATCh.

Figure s19. The pH decay in 100 mM HEPES buffer solution with continuous flow of CO₂ gas.
Figure s20. SEM images of the prepared ZIF-7 (a), ZIF-90 (b), ZIF-65(Zn) (c), and ZIF-67 (d).