

Synergistic effect of N-decorated and Mn²⁺ doped ZnO nanofibers with enhanced photocatalytic activity

Yuting Wang^a, Jing Cheng^a, Suye Yu^c, Enric Juan Alcocer^b, Muhammad Shahid ^a, Ziyuan Wang^a, Wei Pan^{*,a}

^aState Key Laboratory of New Ceramics and Fine Processing, School of Materials Science and Engineering, Tsinghua University, Beijing 100084, People's Republic of China

^bDepartment of materials, Imperial College London, Exhibition Road, London SW7 2AZ, United Kingdom

^cDepartment of Physics, University of Science and Technology Beijing, Beijing 100083, China

Corresponding Author

Correspondence and requests for materials should be addressed to W.P. (email: panw@mail.tsinghua.edu.cn)

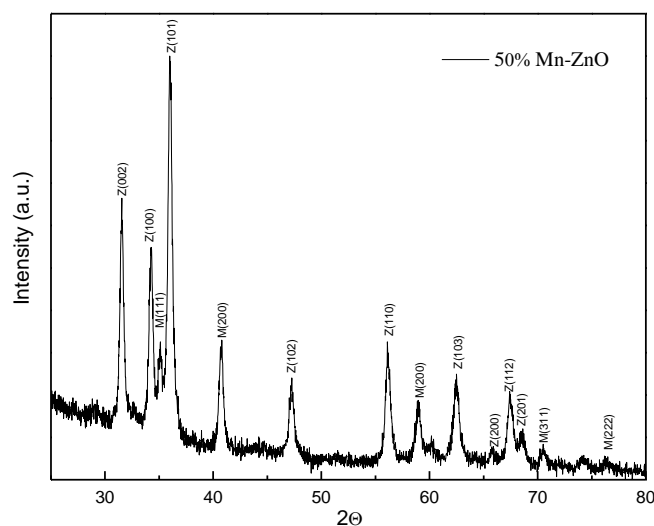


Figure S1. XRD patterns of 50% Mn²⁺-doped ZnO nanofibers.

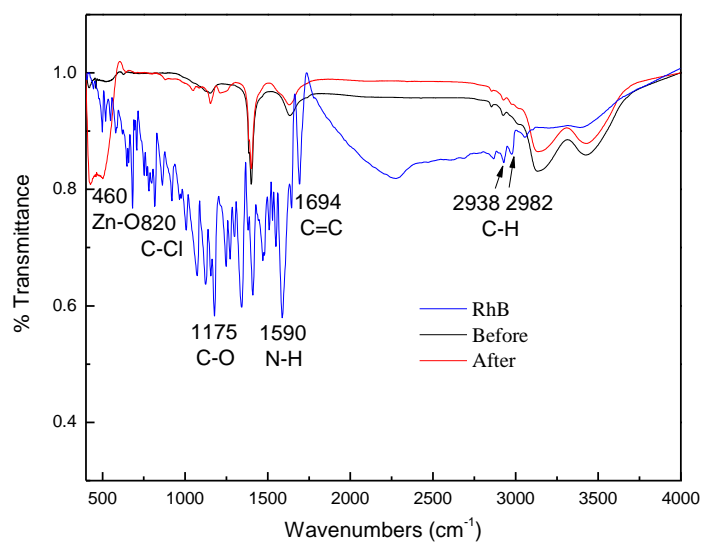


Figure S2. FTIR spectra of RhB, 15% Mn-ZnO NFs before and after photocatalytic cycles.

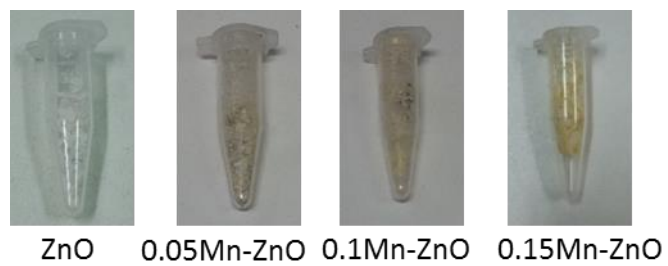


Figure S3. Digital photo images of ZnO, 0.05Mn-ZnO, 0.1Mn-ZnO, 0.15Mn-ZnO NFs powders.

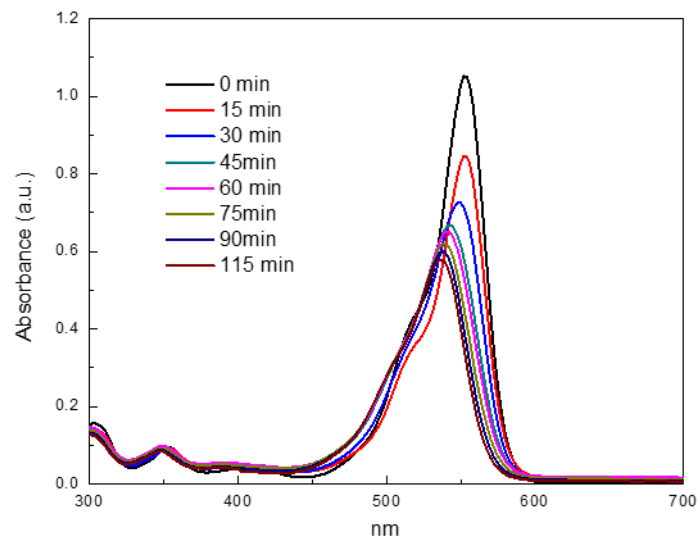


Figure S4. UV-vis absorption spectra of RhB at different time in the presence of 15% Mn²⁺-doped ZnO nanofibers annealed under vacuum.

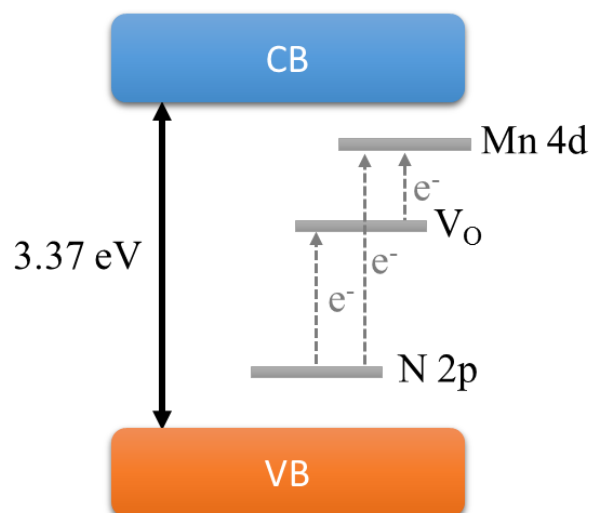


Figure S5. Proposed energy-band structure model for the Mn-doping and N-decorated ZnO photocatalyst.

Table S1 Lattice constants of ZnO and Mn²⁺-doped ZnO nanofibers using XRD.

	a	c
ZnO	3.242	5.194
5% Mn ²⁺ -doped ZnO	3.250	5.209
10% Mn ²⁺ -doped ZnO	3.251	5.211
15% Mn ²⁺ -doped ZnO	3.251	5.211

Table S2 Band gap values of ZnO and Mn²⁺-doped ZnO samples.

Sample	Band gap (Experimental)	Band gap (Calculated)
ZnO	3.25 eV	3.37 eV
5% Mn ²⁺ -doped ZnO	2.5 eV	3.23 eV (4.2%)
10% Mn ²⁺ -doped ZnO	2.4 eV	-
15% Mn ²⁺ -doped ZnO	2.3 eV	-