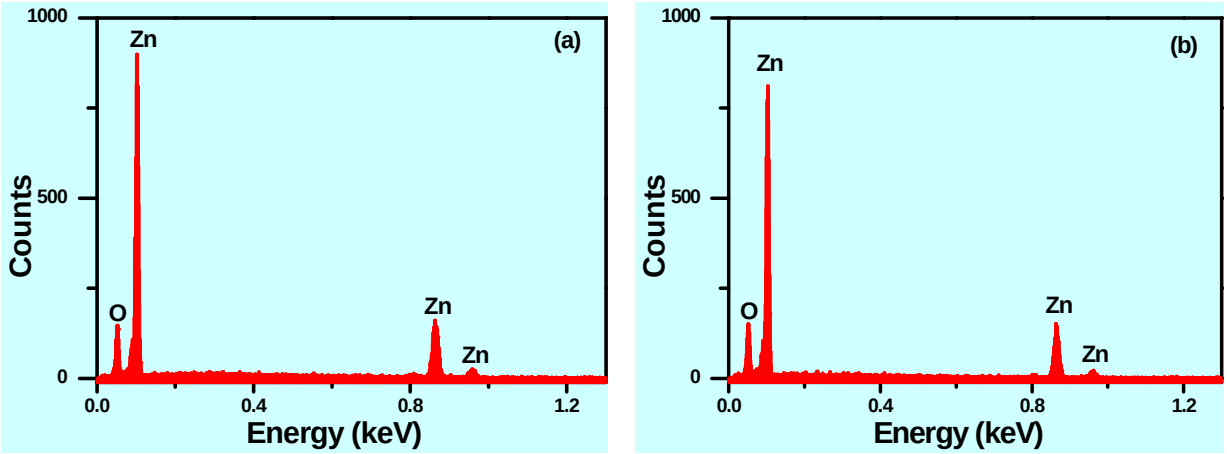
Supporting Information for the Manuscript

One-Pot, High-Yield Synthesis of One-Dimensional ZnO Nanorods with Well-Defined Morphology as a Highly Selective Photocatalyst

Zi-Rong Tang,[*a] Xia Yin,[a] Yanhui Zhang,[a,b] and Yi-Jun Xu[a,b]

[a] *College of Chemistry and Chemical Engineering, New Campus, Fuzhou University, Fuzhou 350108, P. R. China*
[b] *State Key Laboratory Breeding Base of Photocatalysis, College of Chemistry and Chemical Engineering, Fuzhou University, Fuzhou, 350002, P. R. China*
**To whom correspondence should be addressed.*
E-mail: zrtang@fzu.edu.cn



Elements composition of commercial ZnO and ZnO nanorod

ZnO nanorod			**Commercial ZnO**		
Element	Wt %	At %	Element	Wt %	At %
O K	4.48	16.07	O K	5.62	19.55
Zn K	95.52	83.93	Zn K	94.38	80.45
Total	100.00	100.00	Total	100.00	100.00

Fig. S1 The energy dispersive X-ray (EDX) analysis of ZnO nanorod (a) and commercial ZnO (b).

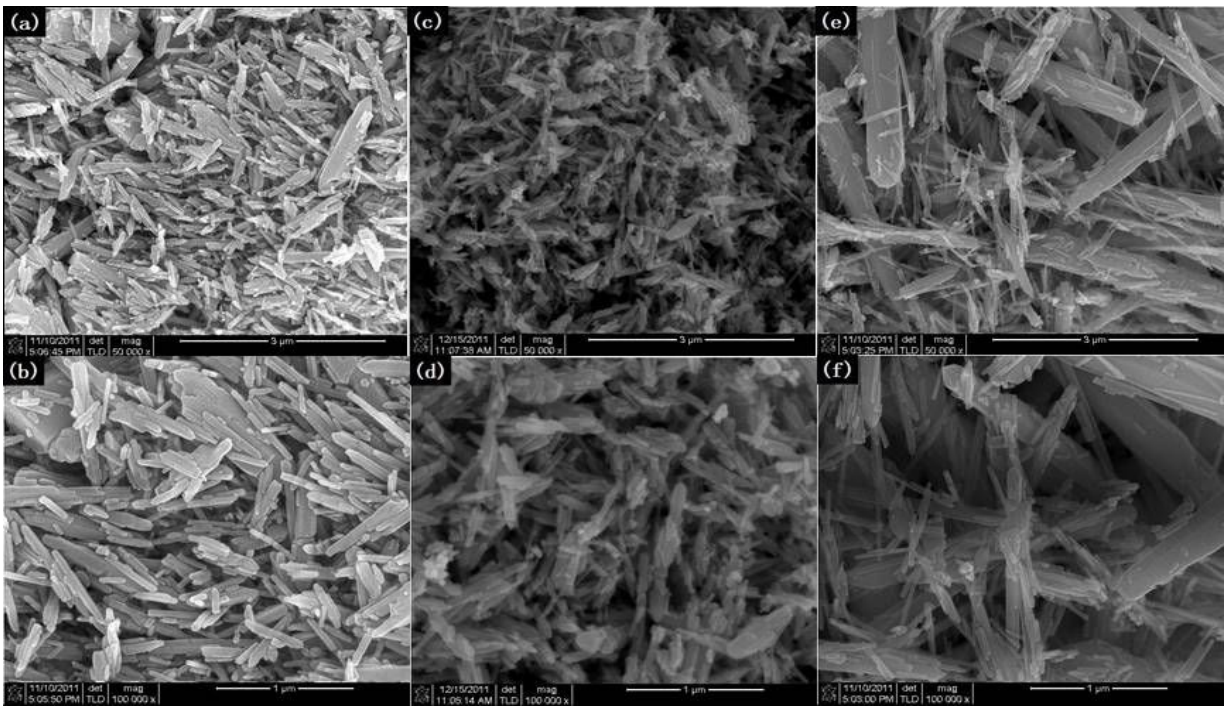


Fig. S2. The SEM images of ZnO nanorods prepared by using different amount of commercial ZnO as precursor. (a, b) 0.05 g, (c, d) 0.15 g, (e, f) 0.2 g.

Note:

According to the previous report (ref.46 cited in our manuscript, *Solid State Commun.* 2007, **141**, 620), the mechanistic details on the formation process of ZnO nanorods can be divided into two stages. In the first stage, equilibrium exists between the H_2O_2 solution and solid ZnO powders in the closed hydrothermal system. In the second stage, H_2O_2 decomposes and releases gaseous oxygen with the temperature rises, which results in a super-saturation state in aqueous solution. In this condition, the ZnO nanorods were formed. According to this mechanistic synthesis of ZnO nanorods, we now modified the detailed synthesis parameters, and our results show that the microscopic synthesis parameters play a significant effect on the morphology and quality of as-obtained ZnO nanorods, as evidenced by the data in Fig. S2. Optimizing the preparation conditions is the key to obtain the 1D ZnO nanorods with well-defined morphology.

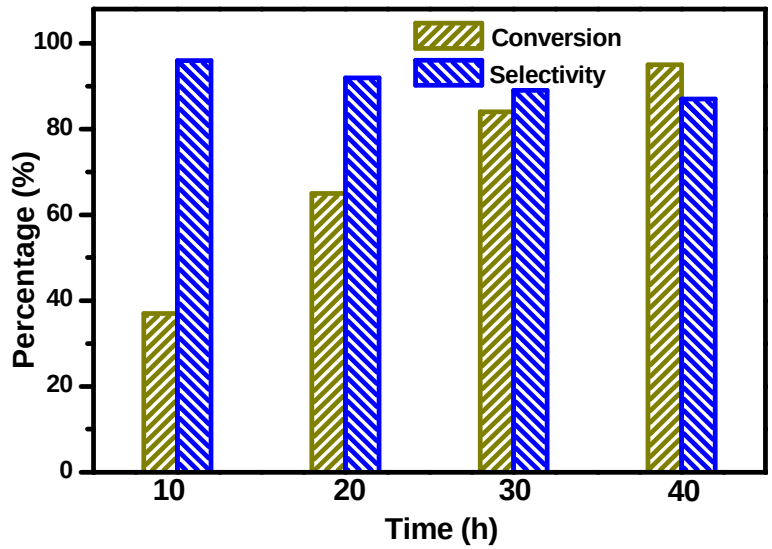


Fig. S3. Time-online profile of photocatalytic oxidation of benzyl alcohol to benzaldehyde over the as-prepared ZnO nanorods under the irradiation of UV light (λ =350 ± 15 nm).

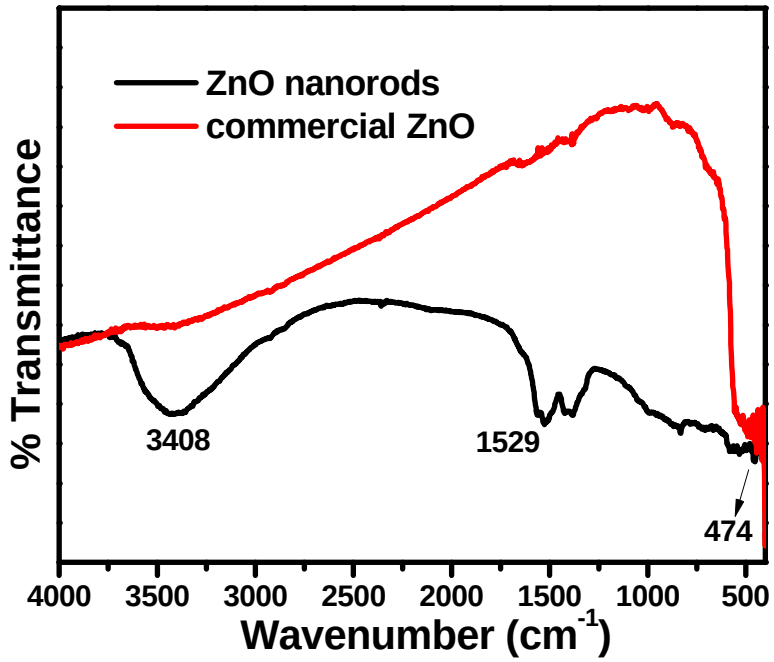


Fig. S4 The FT-IR spectra of ZnO nanorods and commercial ZnO.