

Supporting Information

Influence of ZnWO₄ Nanorod Aspect Ratio on the Photocatalytic Activity

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The concentrations of phenol and most of its reaction intermediates were measured by a HPLC (Agilent 1100) system. A HIQ-SU-C18 reversed phase column was employed. All substances were detected by a UV detector at 269 nm. The eluent consisted of a mixture of water and methanol (40:60 by volume); the flow rate was 1 ml min^{-1} .

The photocatalytic activities of the ZnWO_4 were evaluated by the phenol decomposition under ultraviolet irradiation. Ultraviolet light was obtained by a 12 W Hg lamp ($\lambda = 254\text{ nm}$, the Institute of Electric Light Sources, Beijing) and the average light intensity was 1 mW cm^{-2} . The radiant flux was measured with a power meter (the Institute of Electric Light Sources, Beijing).

The photocatalytic degradation of phenol in the aqueous solutions was studied by using ZnWO_4 as the photocatalyst under room temperature and normal atmosphere pressure. ZnWO_4 (50mg) and 100ml phenol (10 mg/L) aqueous solution were added into the reactor, and then stirred with a magnetic stirrer prior to irradiation with Hg lamp at room temperature. After the reaction, the sample solution was put in centrifuge to remove ZnWO_4 nanorods from solution. The solution obtained this way was extracted into a quartz cell. The absorbance of the samples was measured with quartz cells every 5 min.

Fig. 1 showed the degradation of phenol using ZnWO_4 nanorods obtained at $220\text{ }^\circ\text{C}$. The first-order linear relationship was revealed by the plots of the $\ln(C/C_0)$ vs irradiation time (t), where C was the concentration of phenol at the irradiation time t and C_0 was the concentration in the adsorption equilibrium of the photocatalysts before irradiation. Via the first order linear fit, the determined reaction-rate constants k was 0.0363 min^{-1} . The concentration of phenol was decreased by ZnWO_4 nanorods. Large numbers of photogenerated e^-/h^+ pairs on the surface of ZnWO_4 nanorods led to the rapid oxidation of phenol.

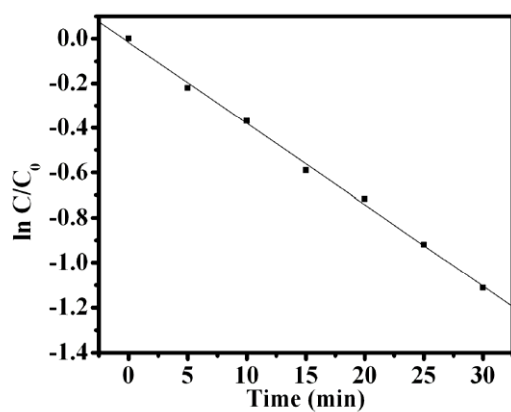


Fig. S1 First-order plots for the photocatalytic degradation of phenol using various ZnWO_4 sample.