Electronic Supplementary Information for

Photocatalytic Primary Alcohol Oxidation on WO_3 Nanoplatelets

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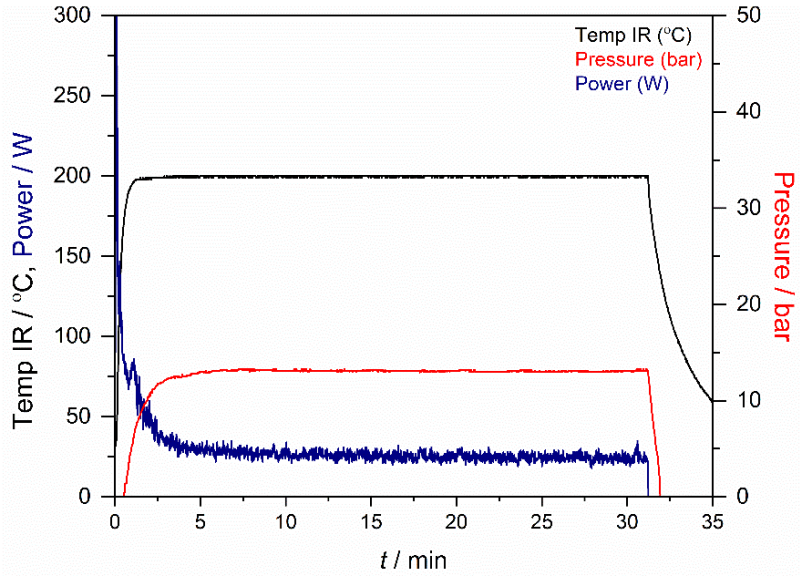

Figure S1. Temperature, Pressure, and Power readings observed during microwave heating at 200°C for 30 minutes.

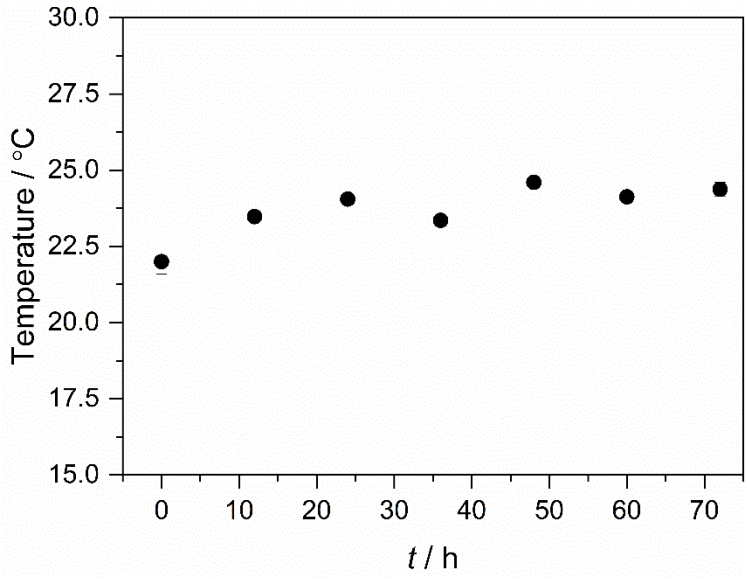

Figure S2. Heating profile for a bare acetonitrile solution when illuminated by the blue LED's.

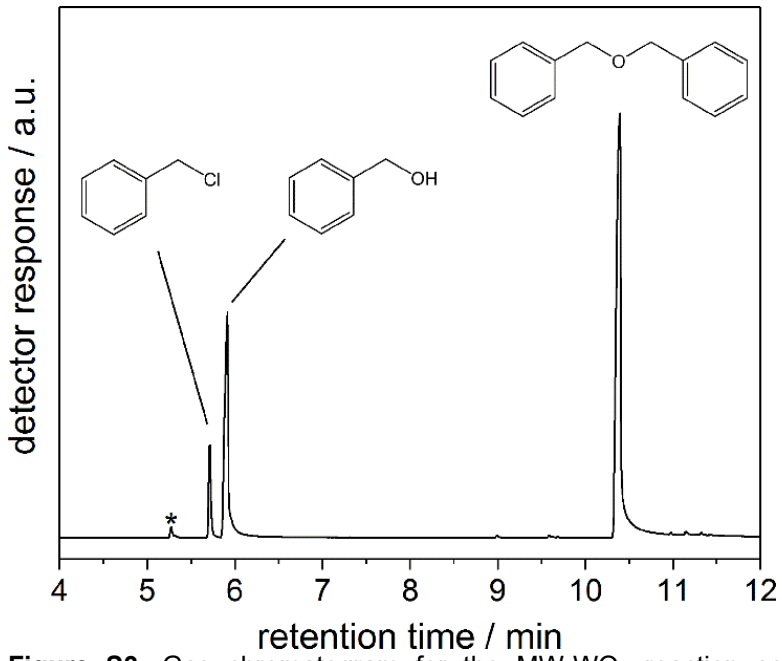

Figure S3. Gas chromatogram for the MW-WO_3 reaction solution. The four peaks correspond to benzaldehyde (5.27 min), benzyl chloride (5.72 min), benzyl alcohol (5.95 min), and dibenzyl ether (10.43 min).

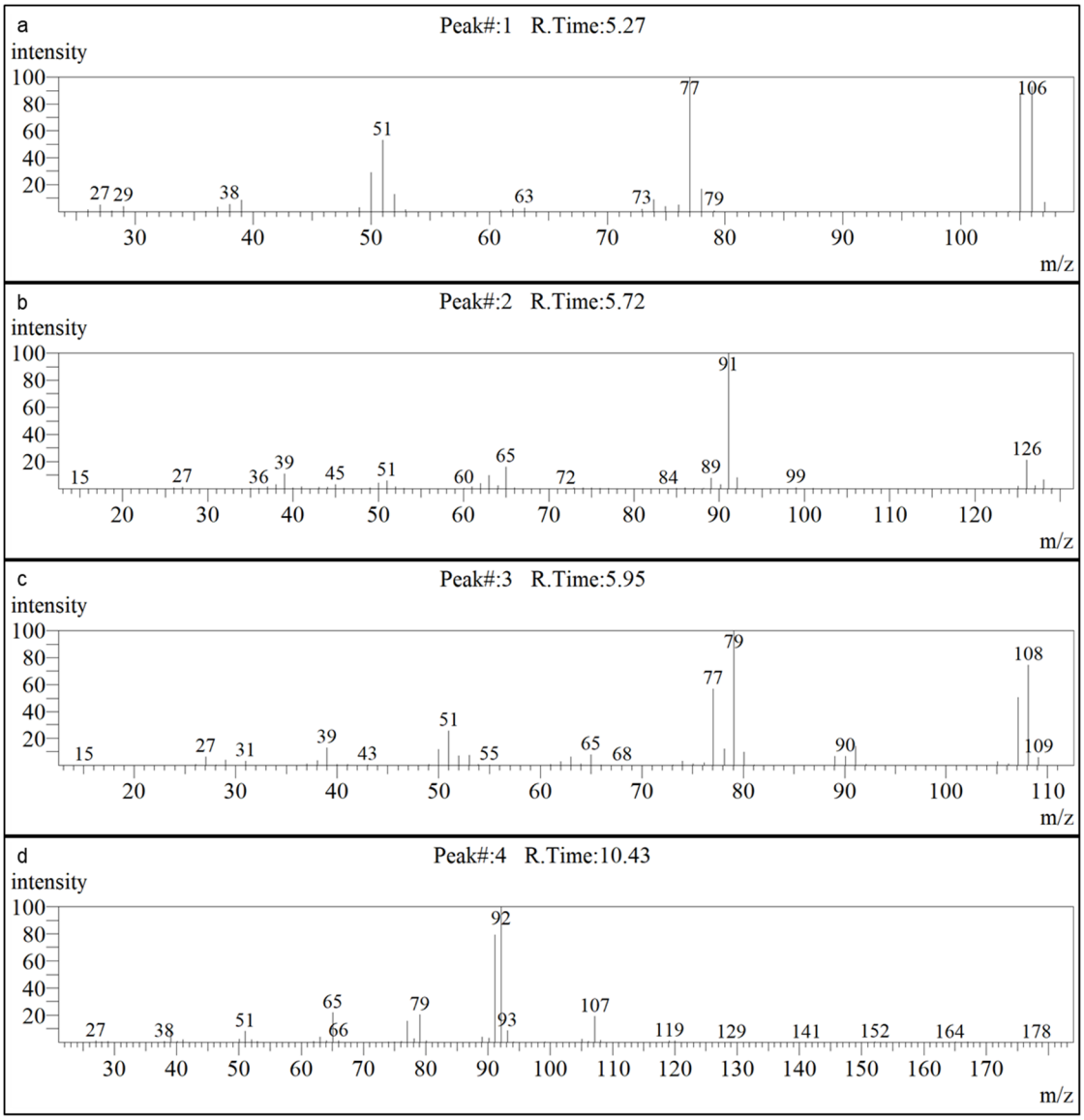

Figure S4. Corresponding mass spectra for the organic by-products observed from GC-MS analysis on the post-synthesis reaction solution. In order, the spectra match to (a) benzaldehyde, C_7H_6O (m/z^+ = 106 Da); (b) benzyl chloride, C_7H_7Cl (m/z^+ = 126 Da); (c) benzyl alcohol, C_7H_8O (m/z^+ = 108 Da); and (d) dibenzyl ether, $C_7H_8^+$ fragment (m/z^+ = 92 Da).

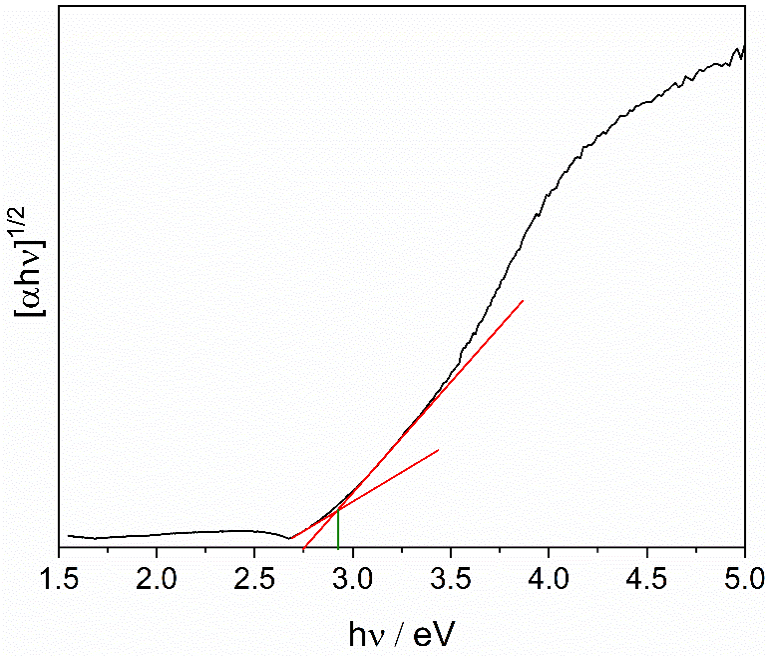

Figure S5. UV-Vis Diffuse Reflectance spectra for WO_3 nanoplatelets.

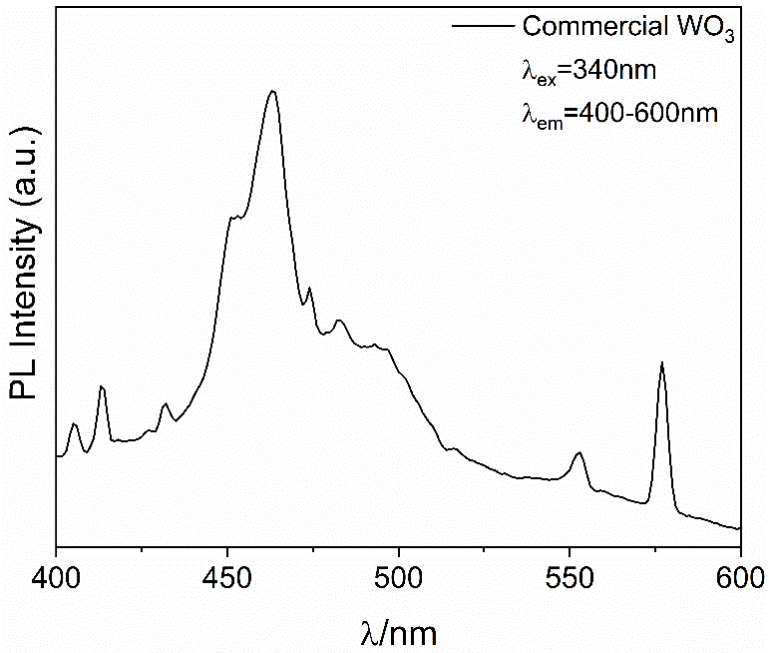

Figure S6. Room temperature photoluminescence spectra for commercially available WO_3 particles. Spectra collect with an excitation wavelength of 340 nm.

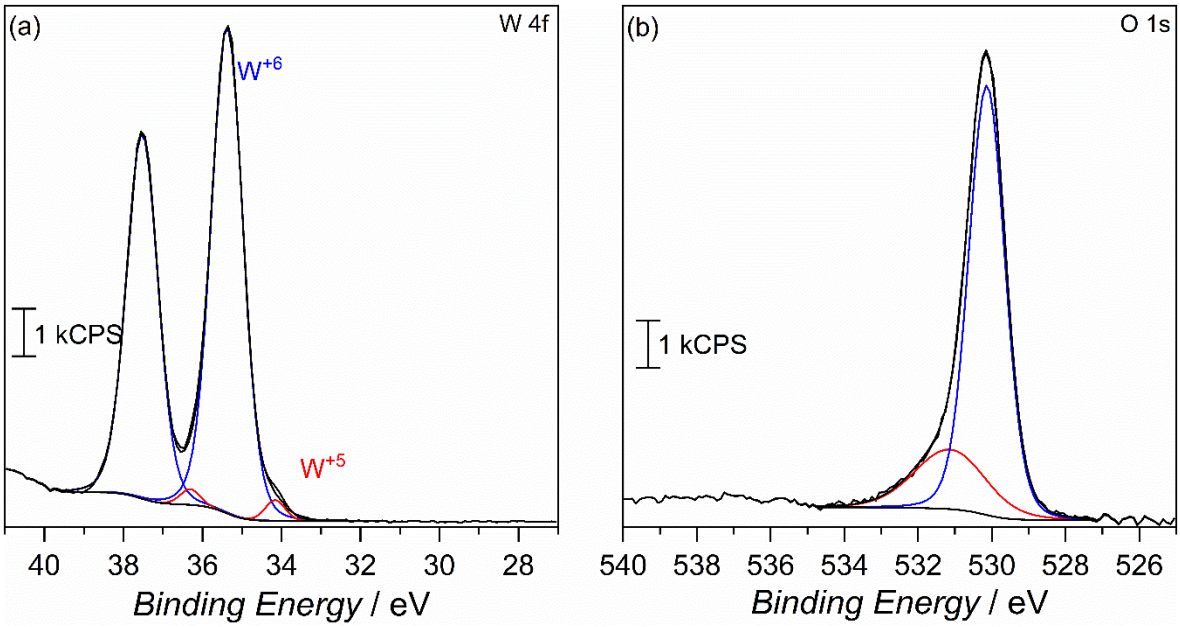

Figure S7. (a) W 4f and (b) O 1s XPS spectra for the commercially available particles.

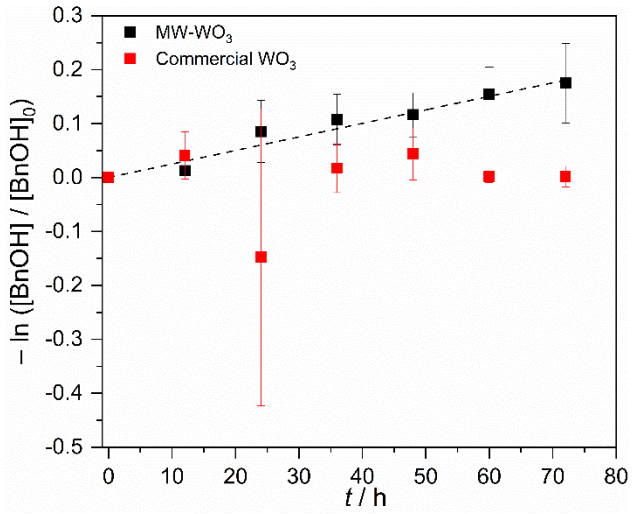

Figure S8. First order rate plot for the photochemical oxidation of BnOH on MW-WO_3 (black squares) and bulk WO_3 (red circles) using 460 nm blue LED's.

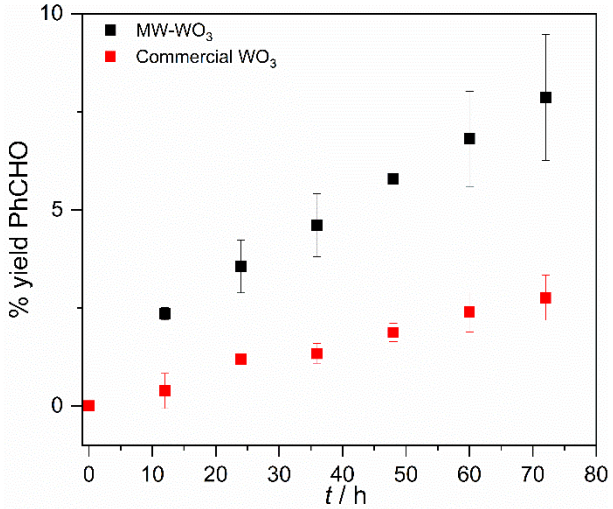

Figure S9. Yield of benzaldehyde over time after the photochemical oxidation of BnOH on MW-WO_3 (black squares) and bulk WO_3 (red circles) using 460 nm blue LED's.

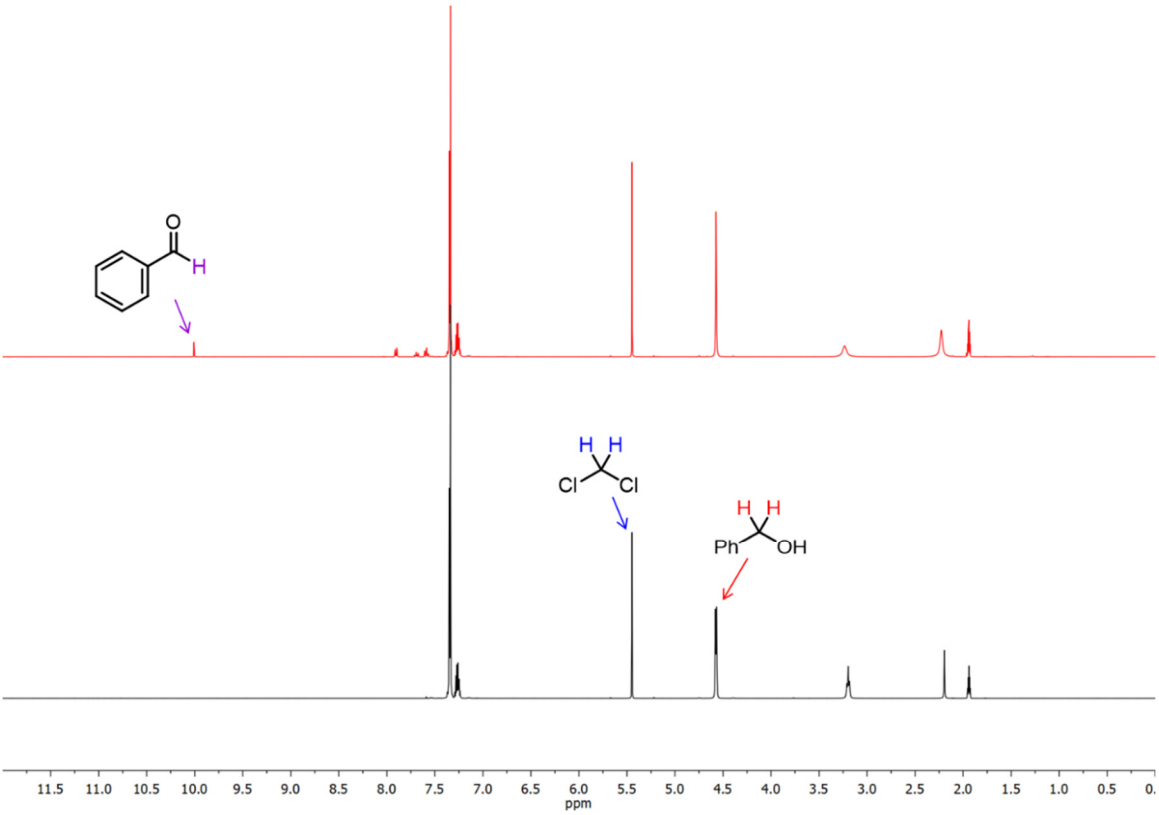

Figure S10. Sample ^{1}H-NMR spectra for the pre-photolysis (black) and post-photolysis (red) oxidation of benzyl alcohol. The post-photolysis measurement was obtained after the 250 mM solution of benzyl alcohol was 9.6% converted. Dichloromethane served as an internal standard for NMR measurements.

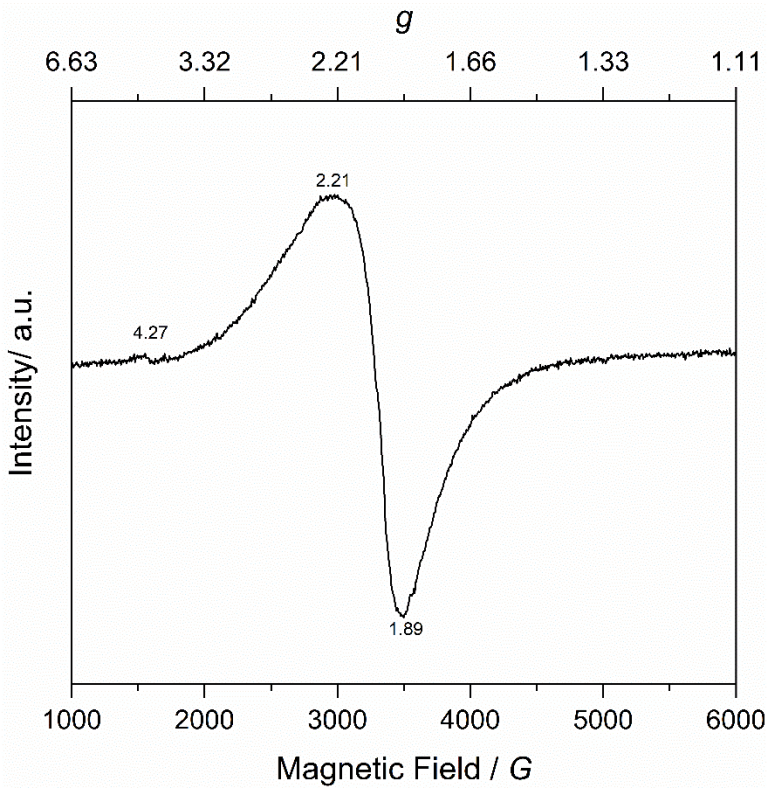

Figure S11. Room temperature EPR spectra for the MW-WO_3 particles after photocatalysis.

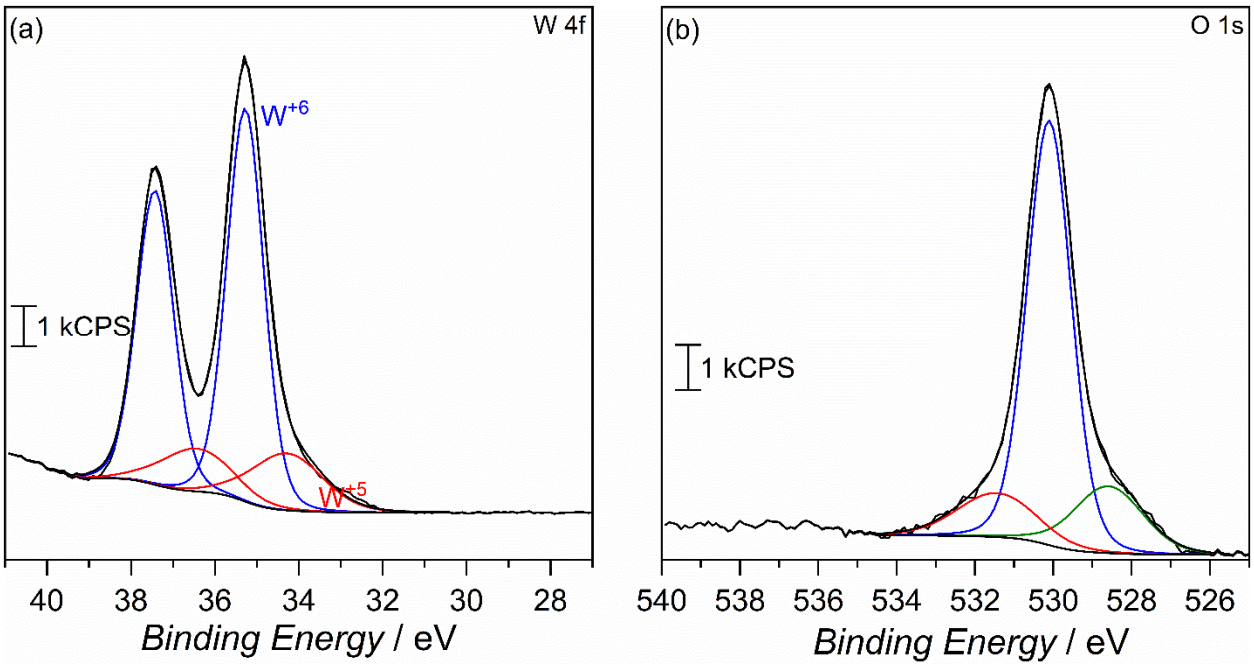

Figure S12. (a) W 4f and (b) O 1s XPS spectra for the MW-WO_3 particles after photocatalysis.

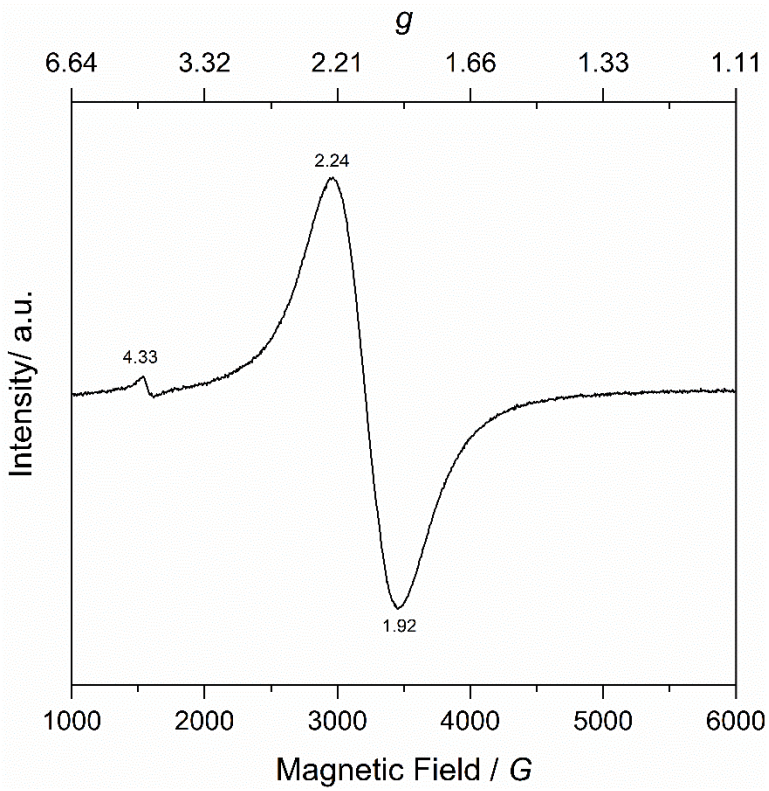

Figure S13. Room temperature EPR spectra for the MW-WO_3 particles after illumination in a substrate-free solution.

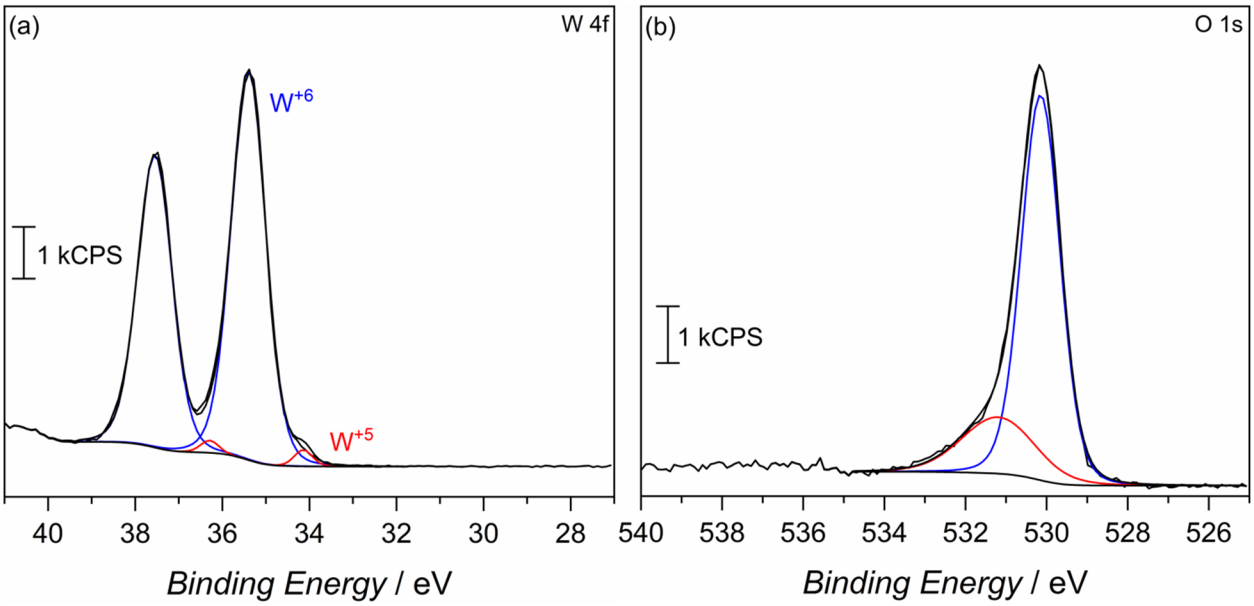

Figure S14. (a) W 4f and (b) O 1s XPS spectra for the MW-WO_3 particles after illumination in a substrate-free solution.

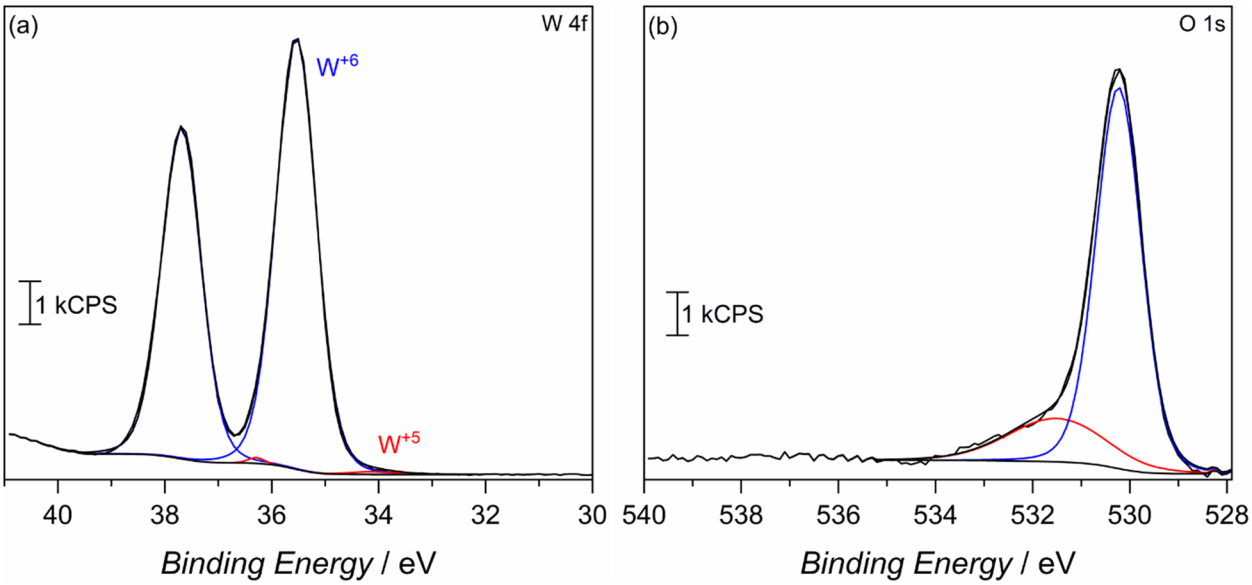

Figure S15. (a) W 4f and (b) O 1s XPS spectra for the commercial WO_3 particles after photocatalysis.