Additional Information for Reviewers



Figure S1: Typical XPS spectrum of the ZnO/Zn(OH)₂ powders synthesised at different temperatures showing a broad range of frequencies. All powders showed only Zn, O, and C present. No Nitrogen compounds (N1s occurs at ca. 400 eV) were observed.



Figure S2: C1s XPS spectra for the powders synthesised at 20°C, 50°C and 70°C. Dashed line represents the adventitious carbon peak at 285 eV used as a reference. The 20°C sample shows a second broad shoulder at 289.1 eV consistent with a small amount of carbonate species. This verifies the assignment of the O1s peak at 530 eV in Figure 3 (20°C) as CO₃.



Figure S3: XPS $O1_s$ spectrum of the sample synthesised at 50°C for 20 min to produce Wülfingite, and then dispersed in water at 90°C for 60 h. By comparison to Figure 4 in the manuscript, one can see that ZnO has formed from the Wülfingite.



Figure S4: Scanning Electron Micrographs showing the change in morphology when Wülfingite (synthesised at 50°C) converts to ZnO by heating for 140 h in 70°C water. (A) Before heating, (B) after heating. Figure A shows a large crystal with the morphology of Wülfingite as well as small nucleates of ZnO. Figure B shows large clusters of ZnO needles. The inset shows the hexagonal morphology of the ZnO needles.