

†Electronic Supplementary Information

Morphology-tunable synthesis of ZnO microstructures under microwave irradiation: formation mechanisms and photocatalytic activity

*Hyung-Bae Kim, Dong-Won Jeong, and Du-Jeon Jang**

Department of Chemistry, Seoul National University, NS60, Seoul 08826, Korea

E-mail: djjang@snu.ac.kr

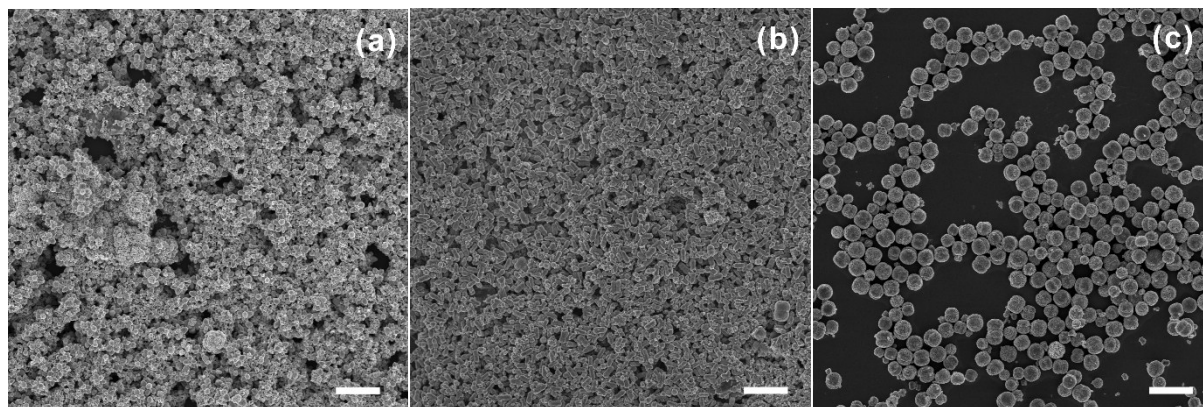


Fig. S1 Low-magnification SEM images of ZnO microstructures prepared at different ammonia concentrations of (a) 0 mM, (b) 43 mM, and (c) 170 mM. Each scale bar indicates 6 μm .

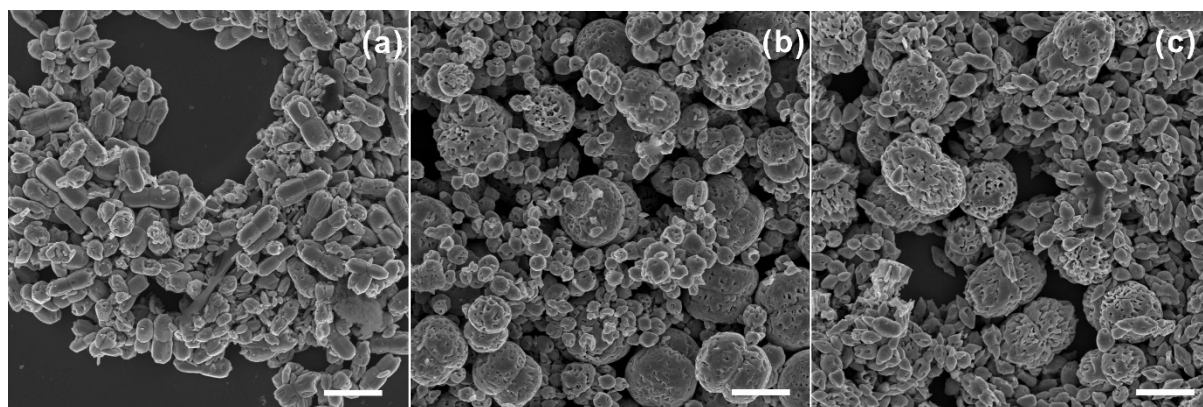


Fig. S2 SEM images of ZnO microstructures prepared at different ammonia concentrations of (a) 17 mM, (b) 85 mM, and (c) 260 mM. Each scale bar indicates 2 μm .

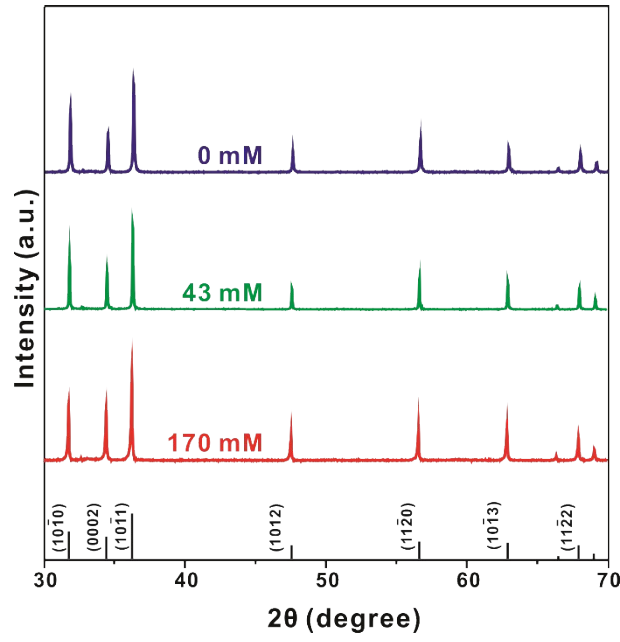


Fig. S3 HRXRD patterns of ZnO microstructures prepared at indicated ammonia concentrations for 10 min. The standard diffraction pattern of the hexagonal wurtzite ZnO is also shown in the bottom.

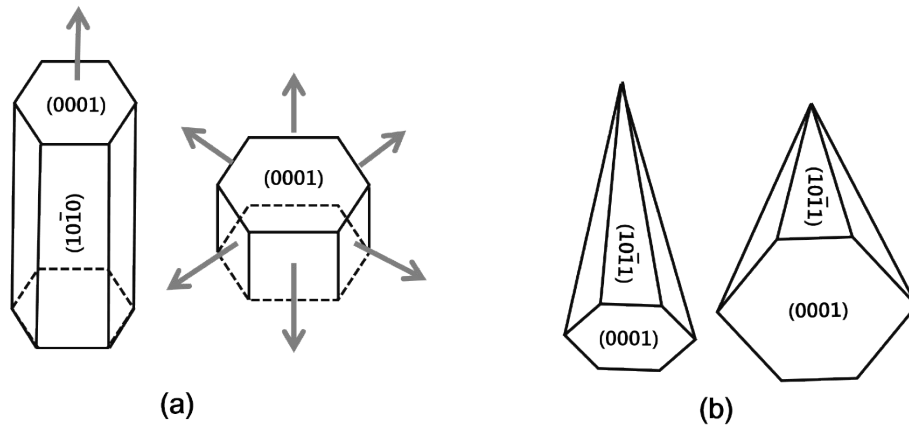


Fig. S4 Schematic illustrations of the hexagonal wurtzite ZnO structures, showing compensatory correlation (a) between (0001) planes and (100) planes and (b) between (0001) planes and (101) planes. Arrows indicate growth directions.

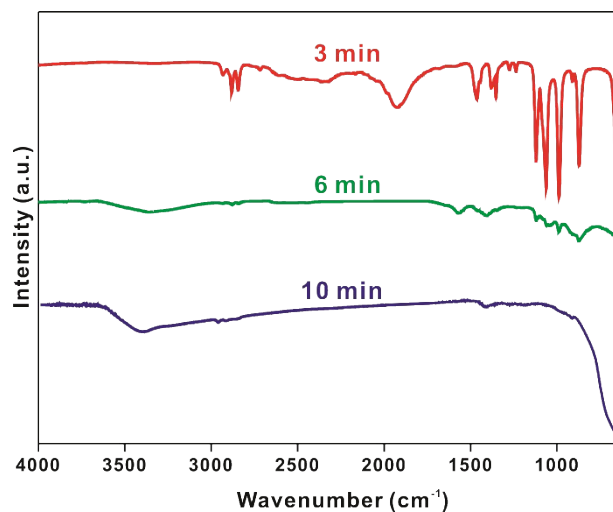


Fig. S5 FTIR spectra of ZnO microstructures synthesized for indicated reaction times at a particular ammonia concentration of 170 mM.

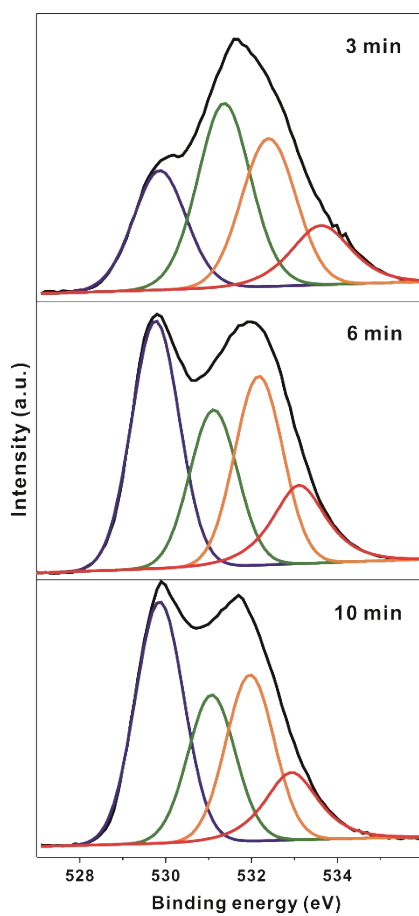


Fig. S6 O 1s XPS spectra of ZnO microstructures synthesized for indicated reaction times at a particular ammonia concentration of 170 mM.

Table S1. Binding Energies in eV for the Deconvoluted Curves of O 1s XPS Spectra

Reaction time	Zn-O-Zn	Zn-O _x -Zn ^a	Zn-O-H	Zn-O-C	C-O-H
3 min	529.9 (23%) ^b	531.4 (35%)	- ^c	532.4 (29%)	533.5 (13%)
6 min	529.8 (37%)	531.1 (24%)	-	532.3 (27%)	533.1 (12%)
10 min	529.8 (38%)	531.1 (24%)	531.9 (26%)	532.7 (12%)	-

^aOxygen-deficient ZnO_x (0 < x < 1). ^bArea percentage of each peak. ^cNot observed.

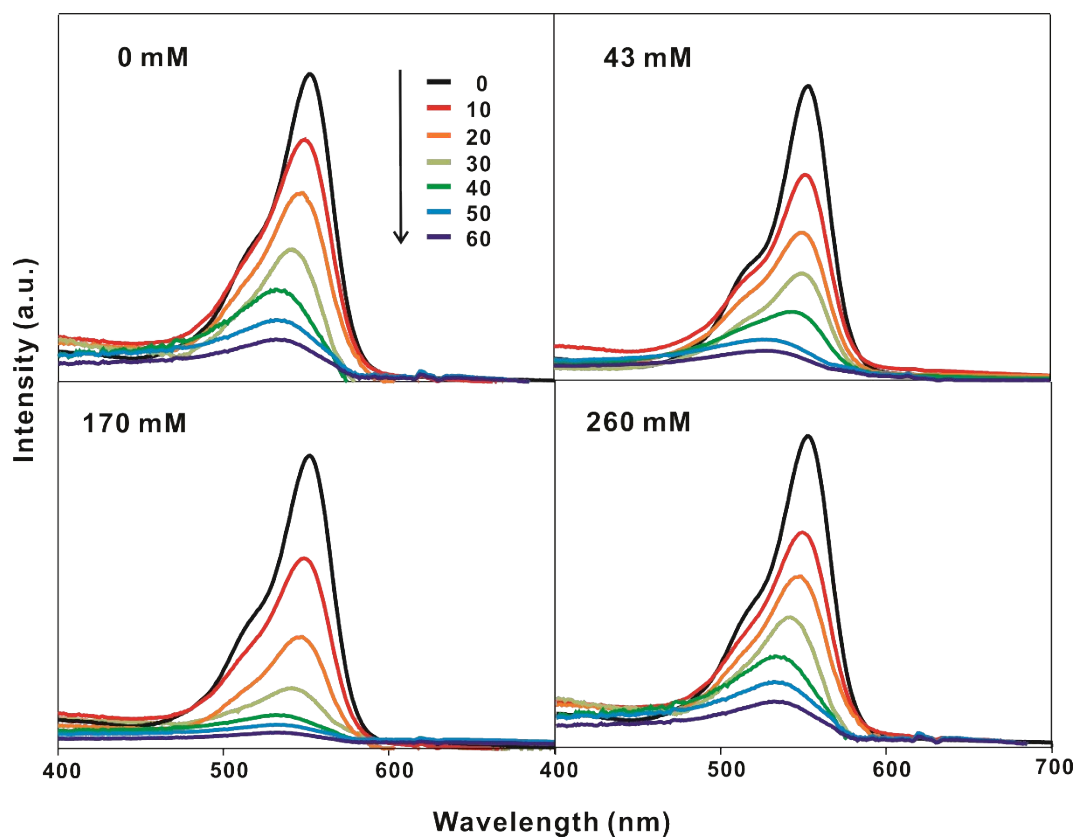


Fig. S7 Absorption spectra of 10 μ M RhB solutions, in the presence of light with ZnO microstructures prepared at indicated ammonia concentrations, measured at elapsed times indicated in the units of min.

