SUPPLEMENTARY DATA

Controlled dispersion of ZnO nanoparticles produced by basic precipitation in solvothermal processes

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S1. X-Ray diffraction of hydrozincite obtained from the synthesis II

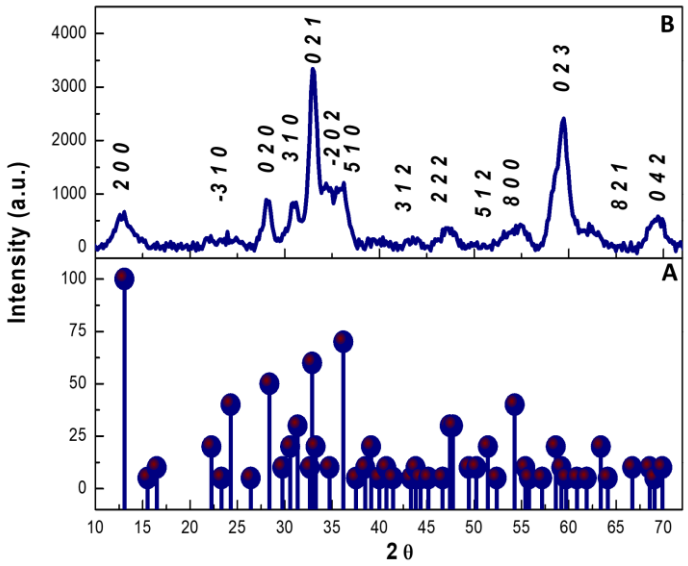

Fig. S1. X-Ray diffraction of **A.** Hydrozincite PDF 19-1458, **B.** Hydrozincite from synthesis II.

S2. X-Ray diffraction sequence of synthesis III with slightly excess of CO_3^{2-}

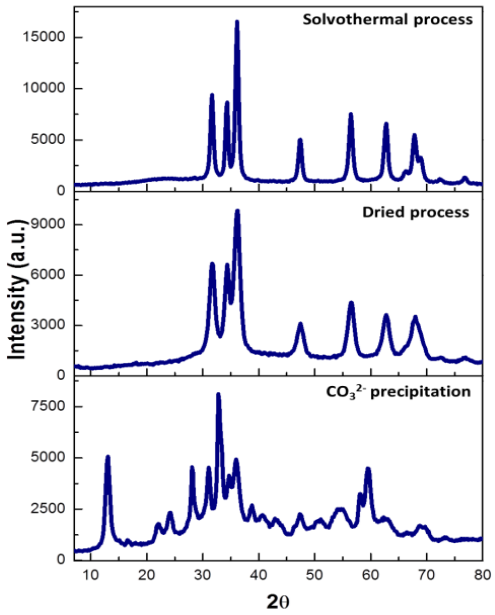

Fig. S2. X-Ray diffraction of synthesis III using slightly excess of CO_3^{2-}.

S3. FT-IR spectra of final ZnO obtained by three different synthetic routes

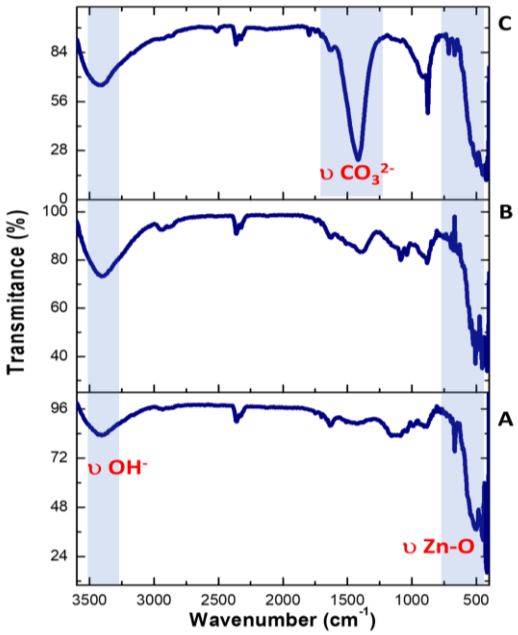

Fig. S3. FT-IR spectra of ZnO obtained after solvothermal treatment from synthesis: **A.** I, **B.** II and **C.** III.

S4. Kubelka – Munk transformed diffuse reflectance spectra of ZnO NPs.

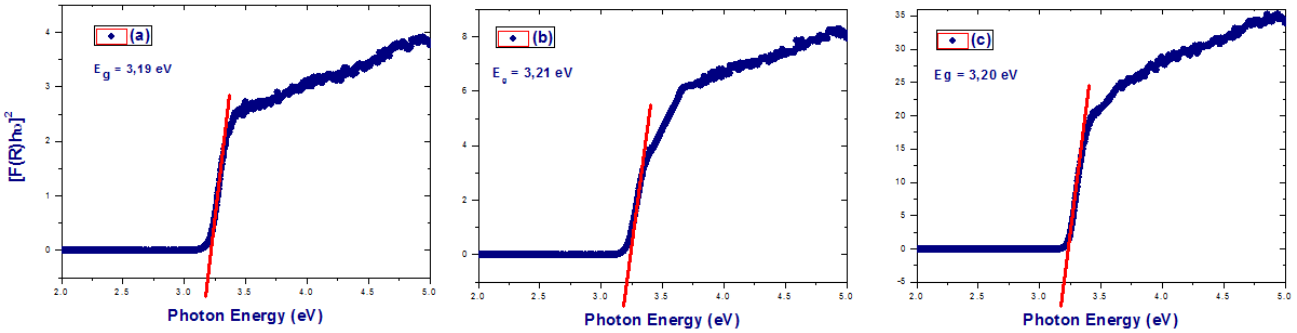

Fig. S4. Kubelka – Munk transformed reflectance spectra of ZnO NPs from synthesis: **(a)** I, **(b)** II and **(c)** III.

S5. TEM images from synthesis I previous solvothermal process

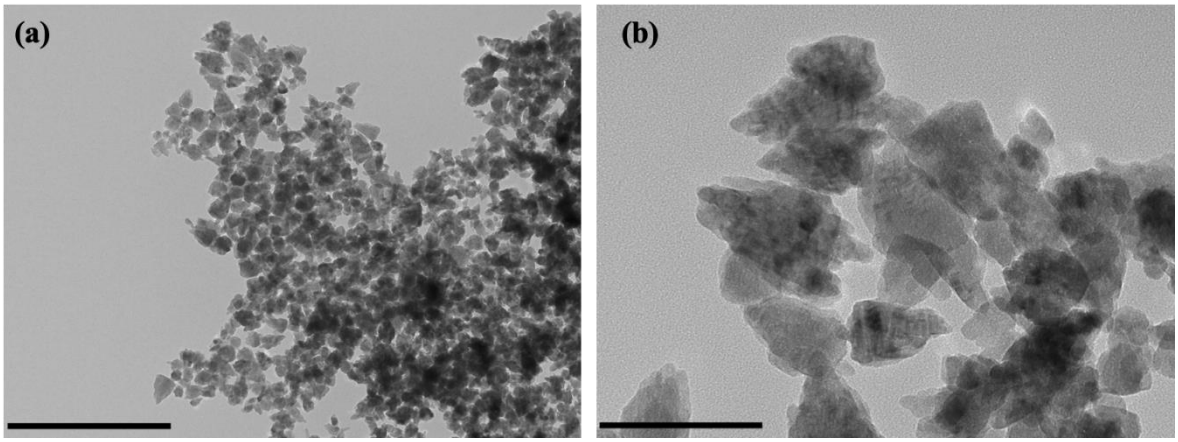

Fig. S5. TEM images from synthesis I. **(a).** Panoramic view and **(b).** details of nano/micro sizes without a defined morphology. Scale bars are 500 nm **(a)** and 100 nm **(b).**

S6. Sequence of TEM images of ZnO NPs synthesis from synthesis III

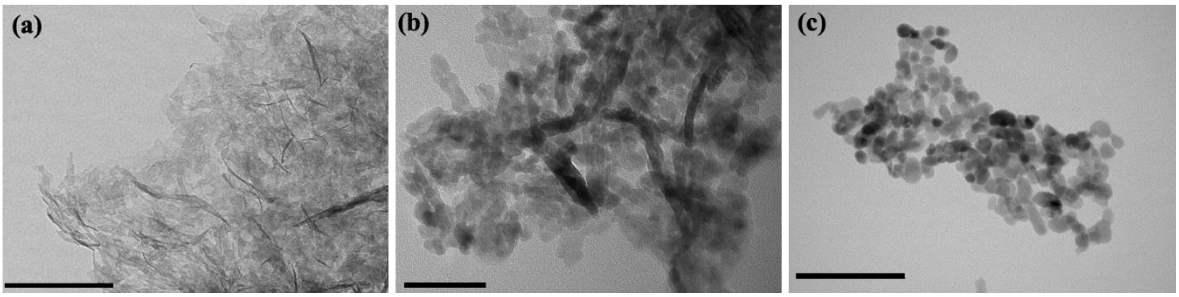

Fig. S6. Sequence of TEM images from ZnO-synthesis III. **(a).** Hydrozincite (CO_3^{2-} precipitation), **(b).** ZnO mix a nanorod/nanoparticle phase (220°C drying process) and **(c).** ZnO NPs from solvothermal treatment to 200°C. Scale bars are 20 nm **(a)**, 50 nm **(b)** and 100 nm **(b).**

S7. TEM images of ZnO structures from the synthesis I then of the ultrasonic treatments

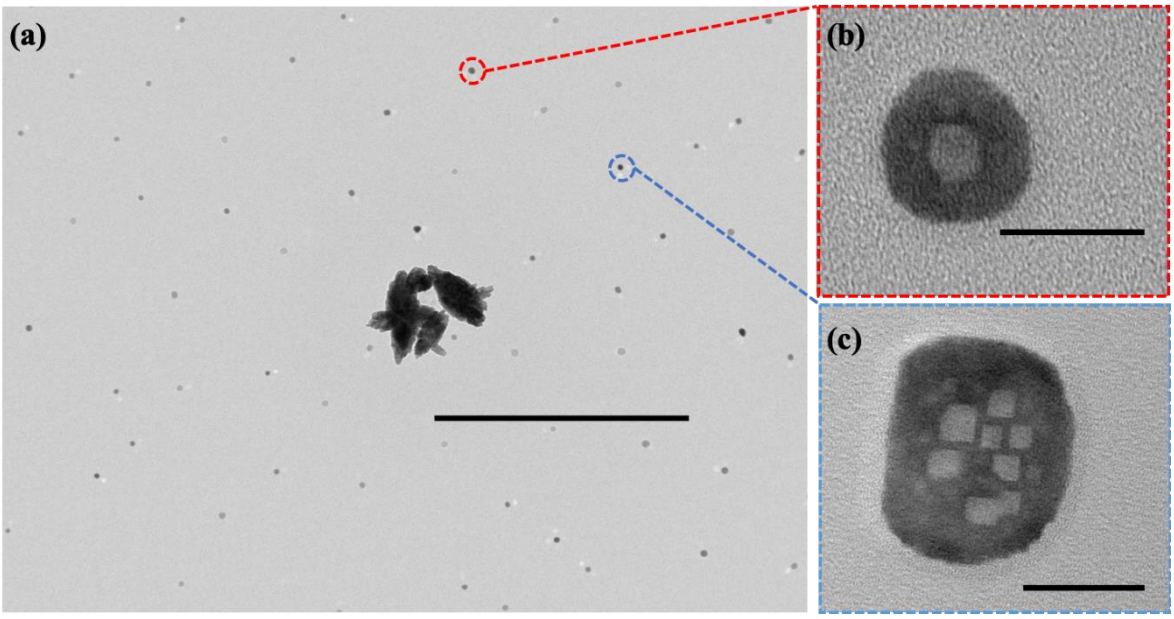

Fig. S7.1. TEM image of ZnO samples obtained from the synthesis I, treated with an ultrasound bath for 15 minutes. Scale bars are 100 nm **(a)** and 20 nm **(b-c).**

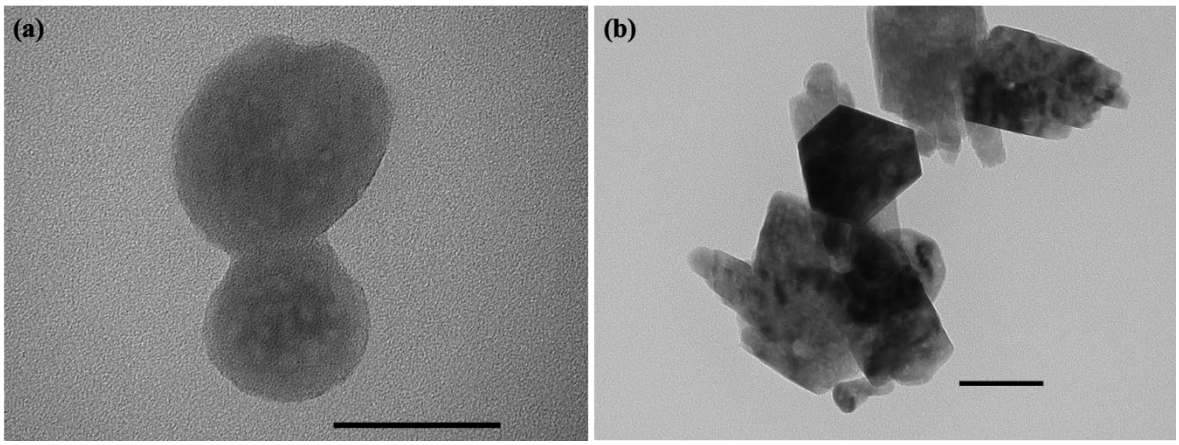

Fig. S7.2 TEM image of ZnO samples obtained from the synthesis I, treated with an ultrasound bath for 30 **(a)** and 60 **(b)** minutes. Scale bar is 50 nm in both cases.

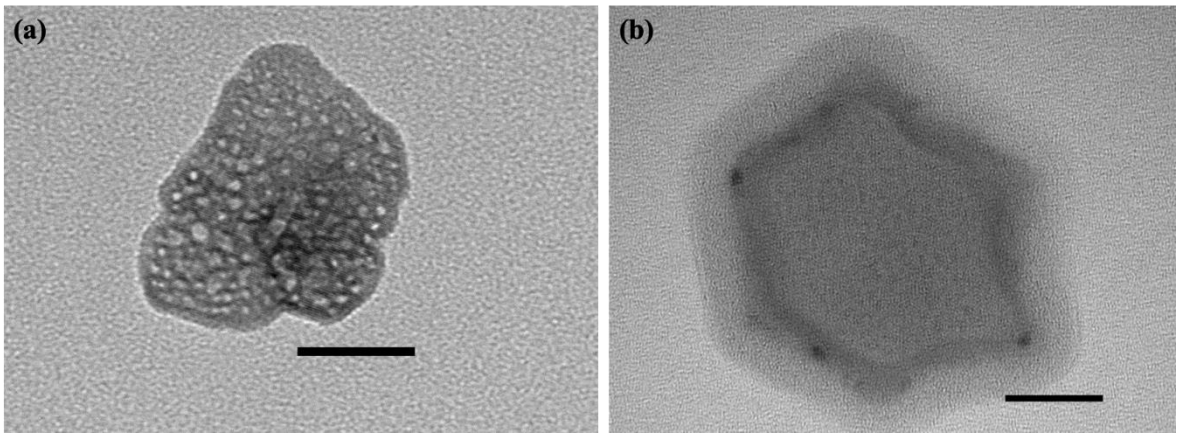

Fig. S7.3. TEM image of ZnO samples obtained from the synthesis I, treated with a probe ultrasonic for 60 **(a)** and 90 **(b)** minutes. Scale bars are 30 nm **(a)** and 20 nm **(b).**