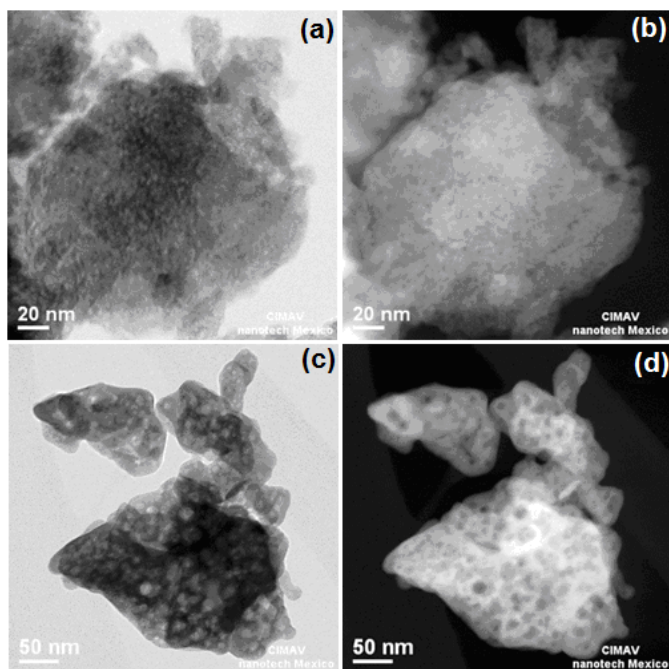


# Order and Disorder Effects in Nano- ZrO<sub>2</sub> Investigated by Micro- Raman and Spectrally and Temporarily Resolved Photoluminescence

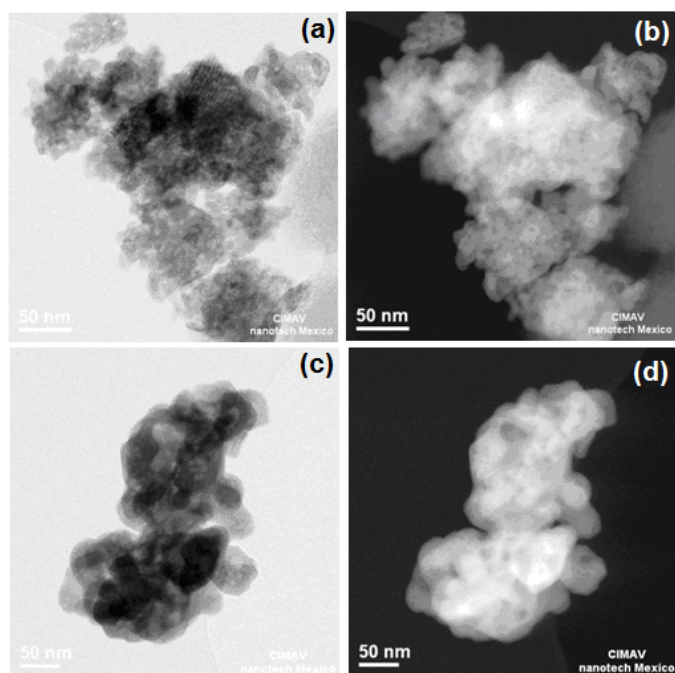
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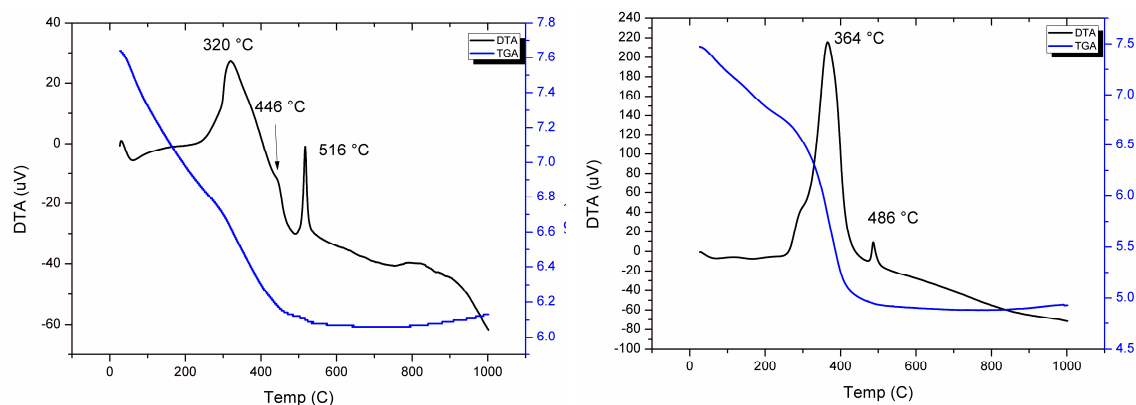
**Supplemental Information**



**Figure S1.** STEM images of calcined pure zirconia samples (ZE) synthesized in o/w microemulsions. ZE-500: (a) bright field and (b) dark field. ZE-1000: (c) bright field and (d) dark field.

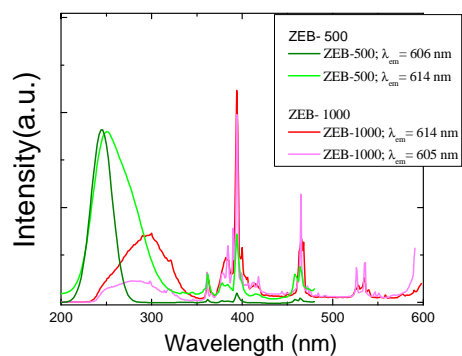


**Figure S2.** STEM images of calcined europium-doped zirconia (ZEB) samples synthesized in o/w microemulsions. 500/ZEB-500: (a) bright field and (b) dark field. 1000/ZEB-1000: (c) bright field and (d) dark field.

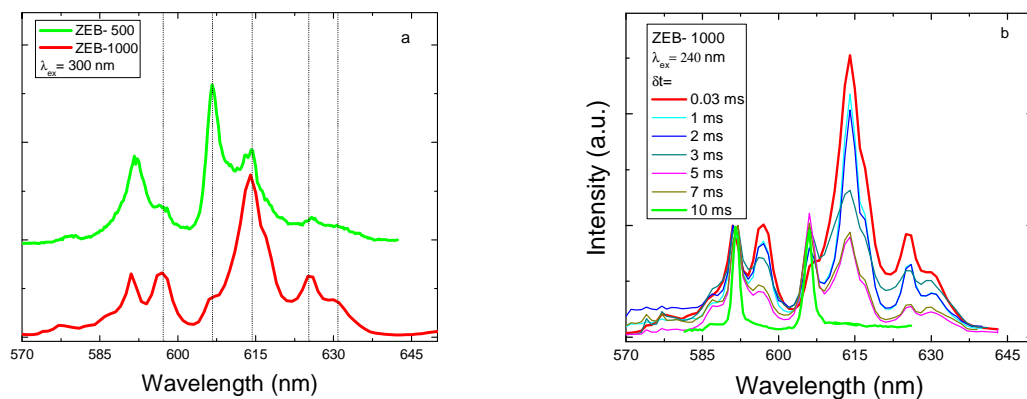


**Figure S3.** TGA and DTA curves for pure (ZE, a) and europium doped zirconia (ZEB, b) samples.

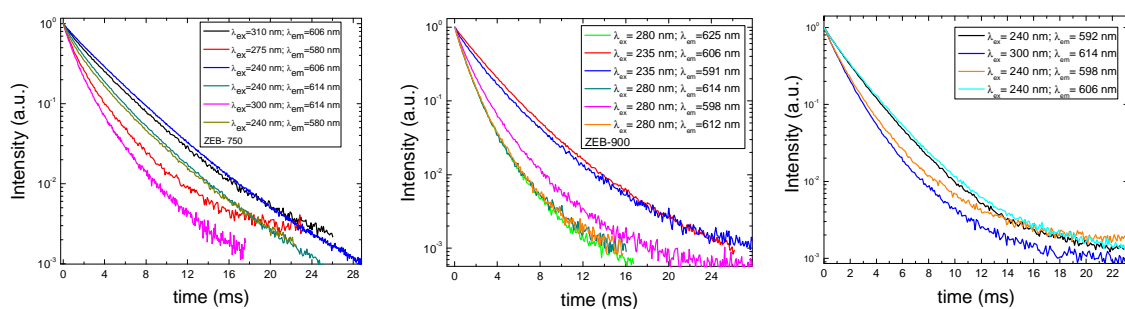
Textural characterization. Pure zirconia, ie ZE sample, after calcining at 350 °C exhibited a surface area of 253 m<sup>2</sup>g<sup>-1</sup> with an average pore size of 26.9 Å. Further calcinations at 500 and 1000 °C led to a strong decrease of the surface areas to 24 and 4 m<sup>2</sup>g<sup>-1</sup>, respectively. Doping with europium (ZEB sample) was not generating important differences in the texture of these materials. Thus, the surface areas of the samples calcined at 350, 500 and 1000 °C corresponded to 248, 31 and 5 m<sup>2</sup>g<sup>-1</sup>, that are in fact very similar.



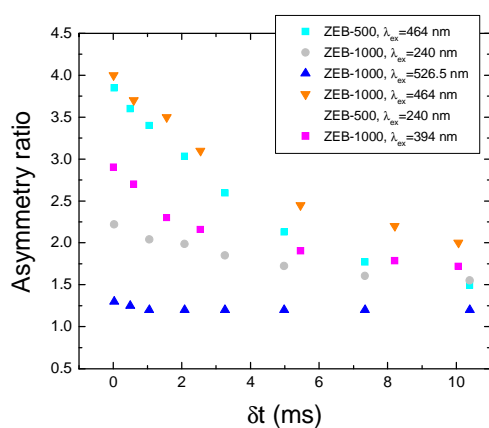
**Figure S4.** PL excitation spectra of europium in ZEB-500 and ZEB-1000.



**Figure S5.** (a) Steady state PL spectra of ZEB-500 and ZEB- 1000; (b) Time-resolved PL spectra of ZEB- 1000 upon excitation at 240 nm.



**Figure S6.** From Left to Right: PL decays of ZEB- 750, ZEB- 900 and ZEB- 1000. Emission and excitation wavelengths are indicated on the Figures.



**Figure S7.** Evolution with delay time of the asymmetry ratio, R, of ZEB- 500 and ZEB- 1000.