SUPPORT INFORMATION

Metal hydroxide-based hydrogels for the thermal preparation of Mg–Zn–O particles

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Table S1. Rietveld and Williansom-Hall results. Phase fraction, lattice parameters (a, b, c), cell volume, average crystallite size, ρ is the Williamson and Smallman's dislocation density, microstrain and X^2 is the final convergence criteria for the Rietveld Method.

Zn/Mg	phase fractions (%)	a,b,c (A)	V (A^3)	ρ (nm^{-2})	Crystallite size (nm)	Micro-strain (%)	X^2
ZnO	ZnO 100%	a=b=3.2562(3) c=5.2122(5)	47.8(3)	0.00277	19(3)	0.186(4)	1.64
MgO:ZnO 1:10	MgO 5.4 %	a=b=c=4.209(3)	74.58(7)	0.00592	13(5)	0.813(6)	1.84
	ZnO 94.6 %	a=b=3.2510(17) c=5.206(3)	47.65(3)	0.00082	35(5)	0.087(12)	
MgO:ZnO 1:5	MgO 16.0 %	a=b=c=4.2200(8)	75.15(6)	0.00174	24(4)	1.07(3)	1.28
	ZnO 82.2 %	a=b=3.248(13) c=5.1979(3)	47.48(5)	0.00148	26(3)	~0	
MgO:ZnO 1:3	MgO 26.9 %	a=b=c=4.2167(8)	75.03(4)	0.00510	14(3)	0.0020(3)	1.55
	ZnO 73.1 %	a=b=3.2497(2) c=5.1996(4)	47.55(5)	0.00826	11(3)	0.0050(10)	
MgO:ZnO 1:1	MgO 51.4 %	a=b=c=4.2206(3)	75.18(5)	0.00309	18(7)	0.130(13)	1.31
	ZnO 48.6 %	a=b=3.2529(3) c=5.2046(4)	47.70(4)	0.00082	35(2)	0.224(15)	
MgO:ZnO 3:1	MgO 66.5 %	a=b=c=4.2212(3)	75.22(3)	0.00510	14(3)	0.223(4)	1.39
	ZnO 33.5 %	a=b=3.2534(3) c=5.2079(5)	47.74(9)	0.00073	37(3)	0.1160(8)	
MgO:ZnO 5:1	MgO 78.2 %	a=b=c=4.2193(3)	75.11(6)	0.00826	11(3)	0.0200(3)	1.4
	ZnO 20.8 %	a=b=3.2516(4) c=5.2069(5)	47.68(3)	0.00346	17(3)	0.0002(3)	
MgO:ZnO 10:1	MgO 87.4 %	a=b=c=4.2167(3)	74.95(4)	0.01235	9(5)	0.368(7)	2.11
	ZnO 12.6 %	a=b=3.25278(13) c=5.2056(3)	47.67(5)	0.00309	18(7)	0.0340(10)	
MgO	MgO 100%	a=b=c=4.2269(8)	75.52(5)	0.02778	6.0(8)	0.54(3)	1.2

Fig. S1: Process for the preparation of MgO:ZnO.

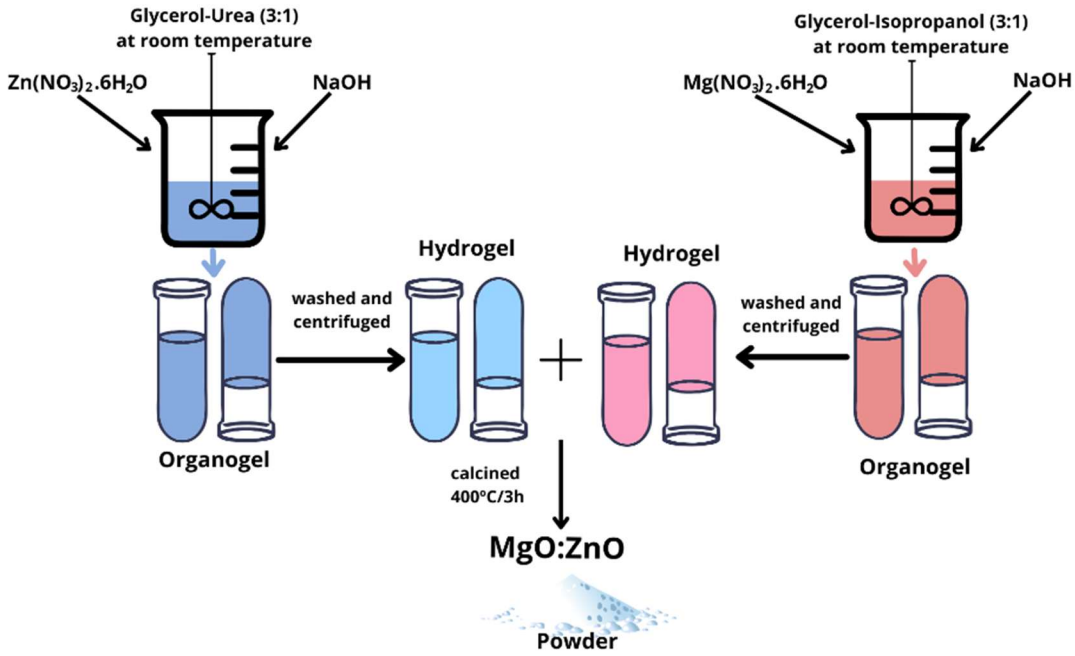


Fig. S2: SEM images of typical ZnO and MgO particles (spherical- and flake-shaped, respectively)

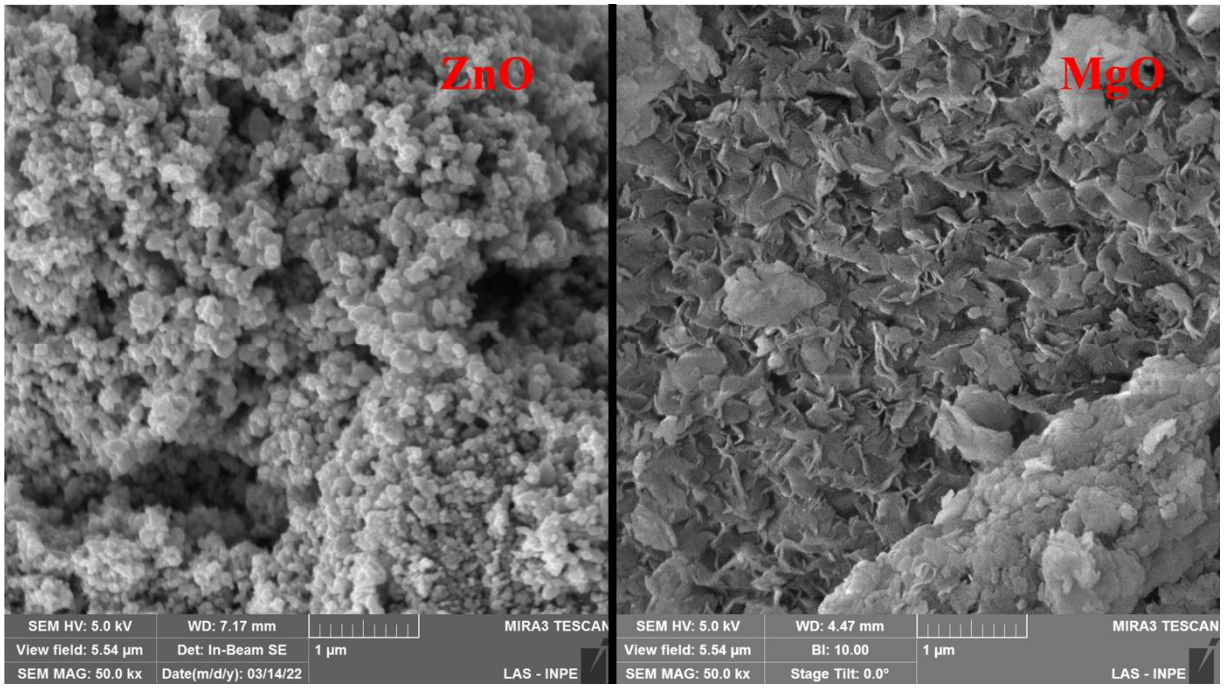


Figure S3: Histogram results. Histograms were obtained by measuring all TEM images for the samples on ImageJ Software. The average TEM size was obtained by simple statistics and maximum and minimum values.

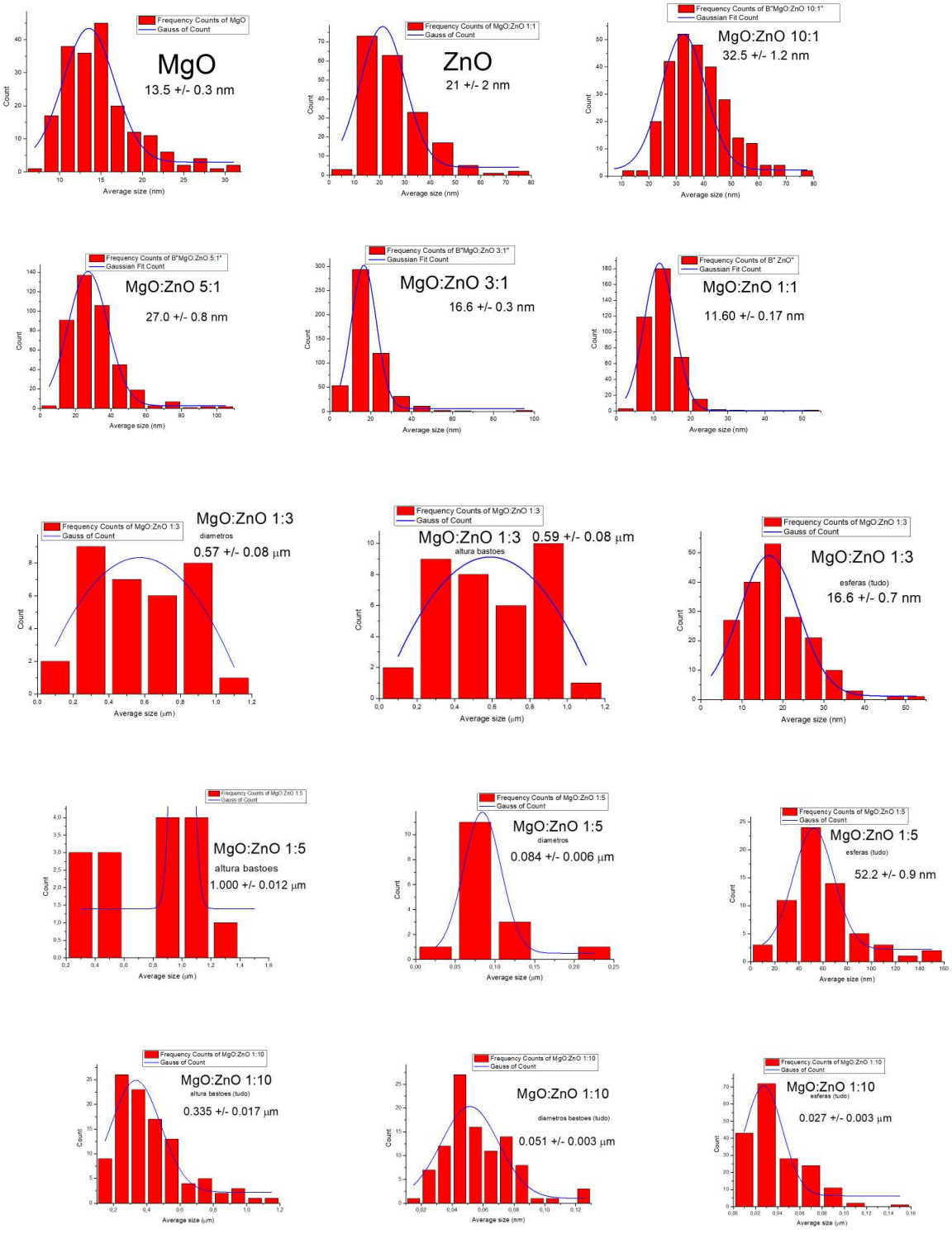
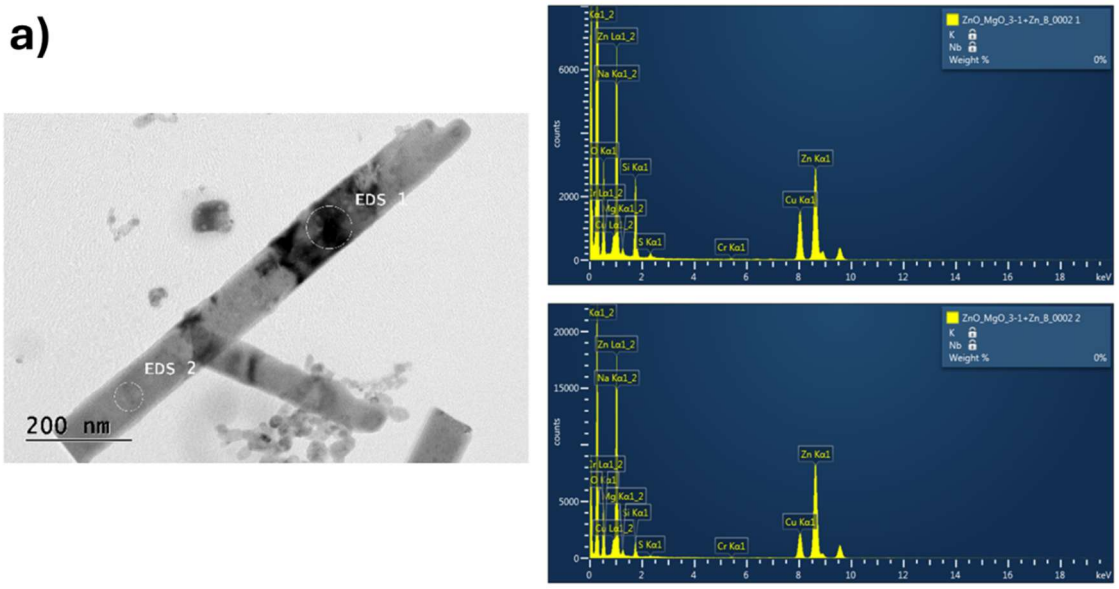
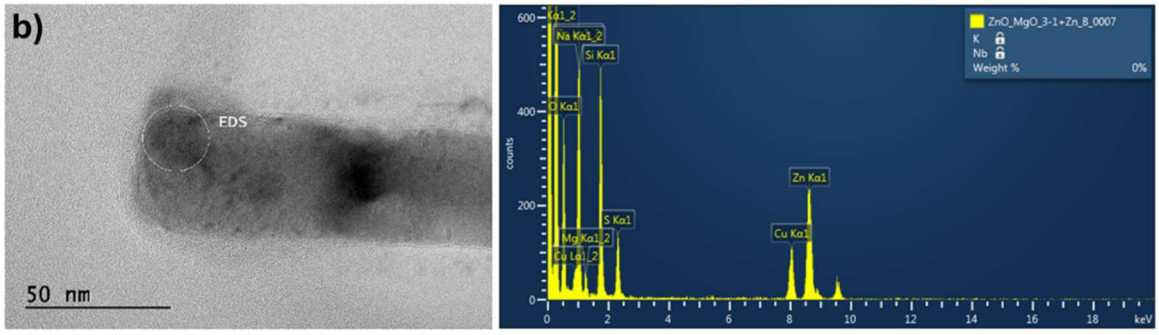


Fig. S4: TEM images and EDS showing the morphology and composition for MgO:ZnO 1:3 ((a), (b) and (c).





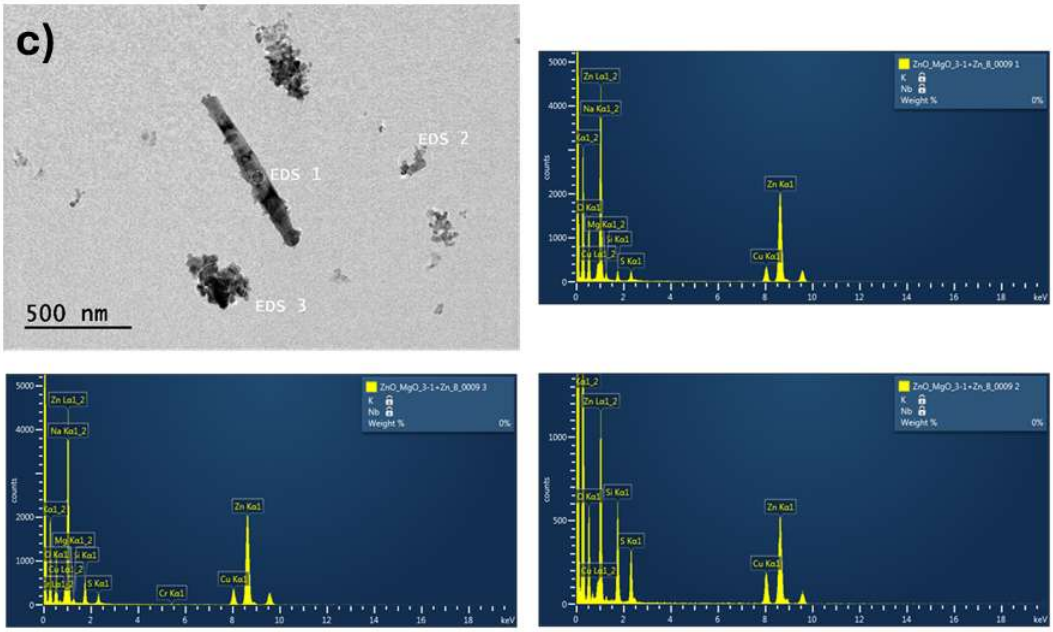


Fig. S5: TEM images and EDS showing the morphology and composition for MgO:ZnO 1:10.

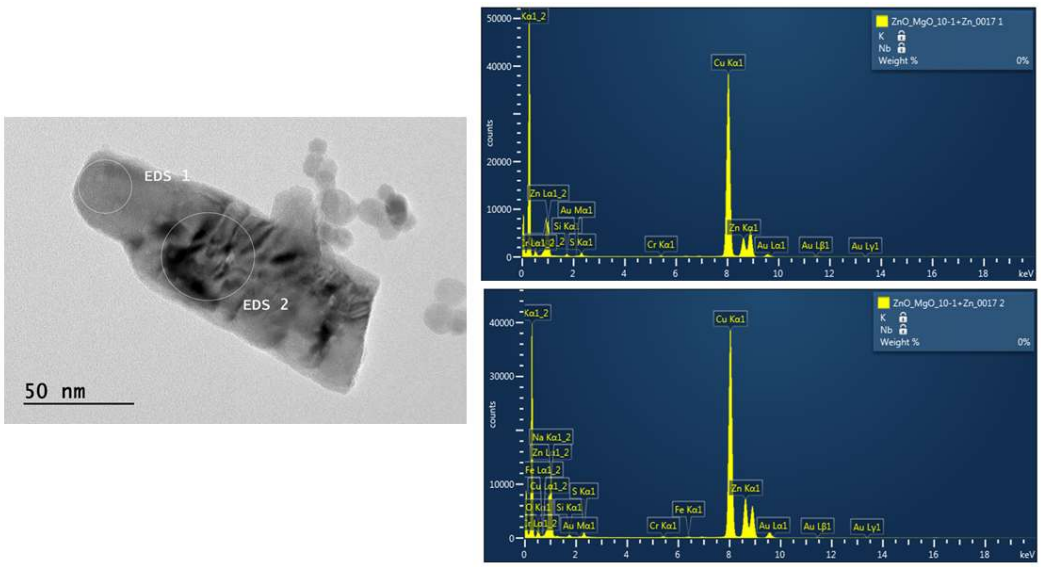
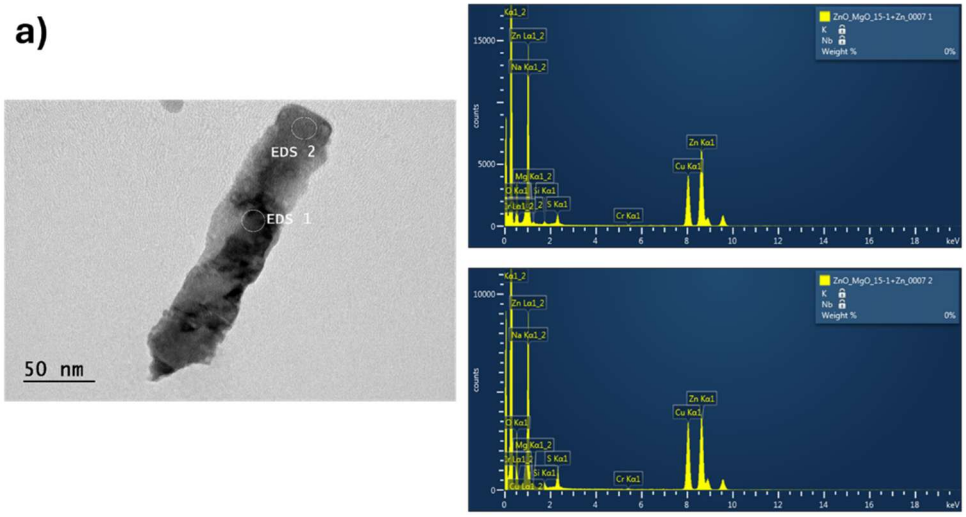


Fig. S6: TEM images and EDS showing the morphology and composition for MgO:ZnO 1:15 ((a), (b) and (c)).



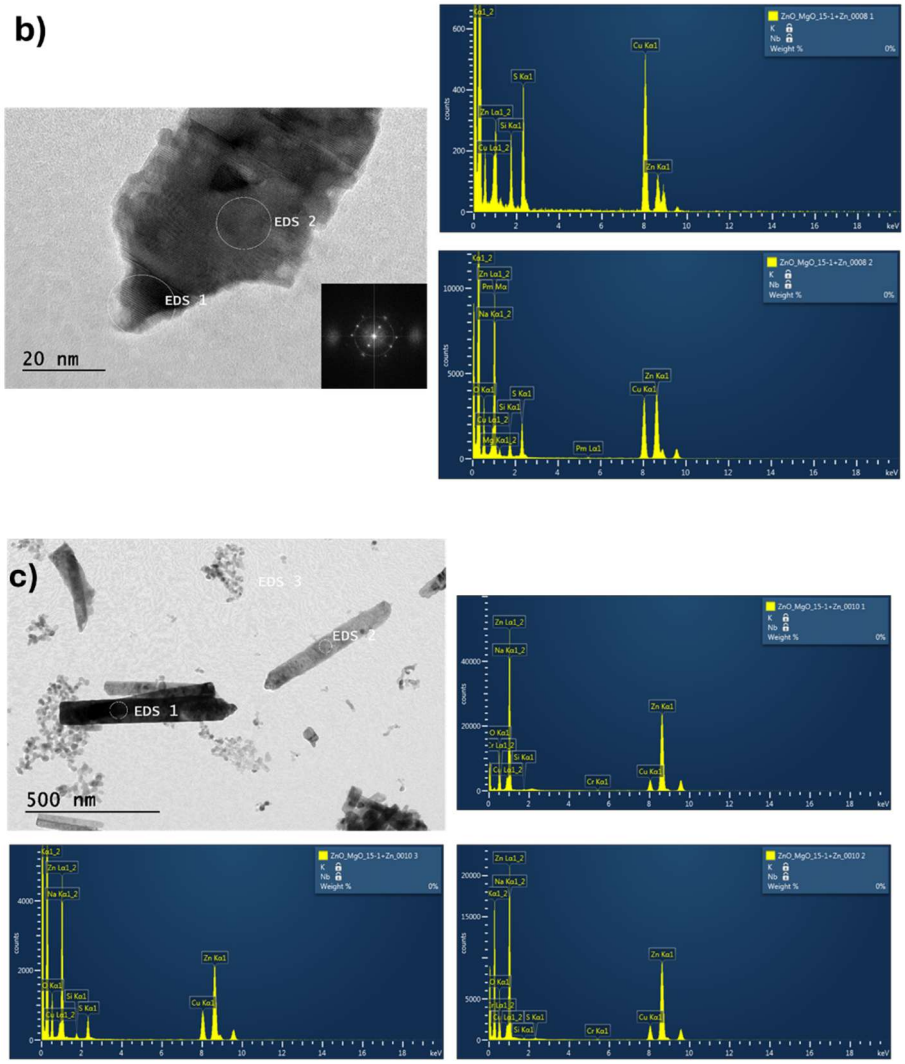


Fig. S7: TEM images and EDS showing the morphology and composition for MgO:ZnO 1:20.

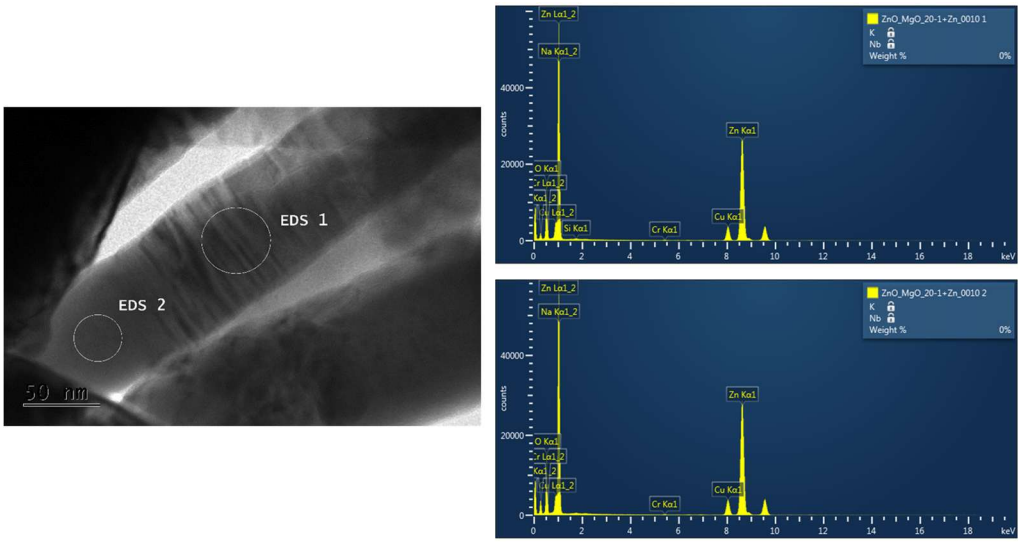


Fig. S8: TEM images showing the morphology for MgO:ZnO: (a) 1:1 and insert of electron diffraction of both ZnO and MgO crystalline phases, showing particle crystalllinity, (b) 3:1, (c) 5:1 and (d) 10:1.

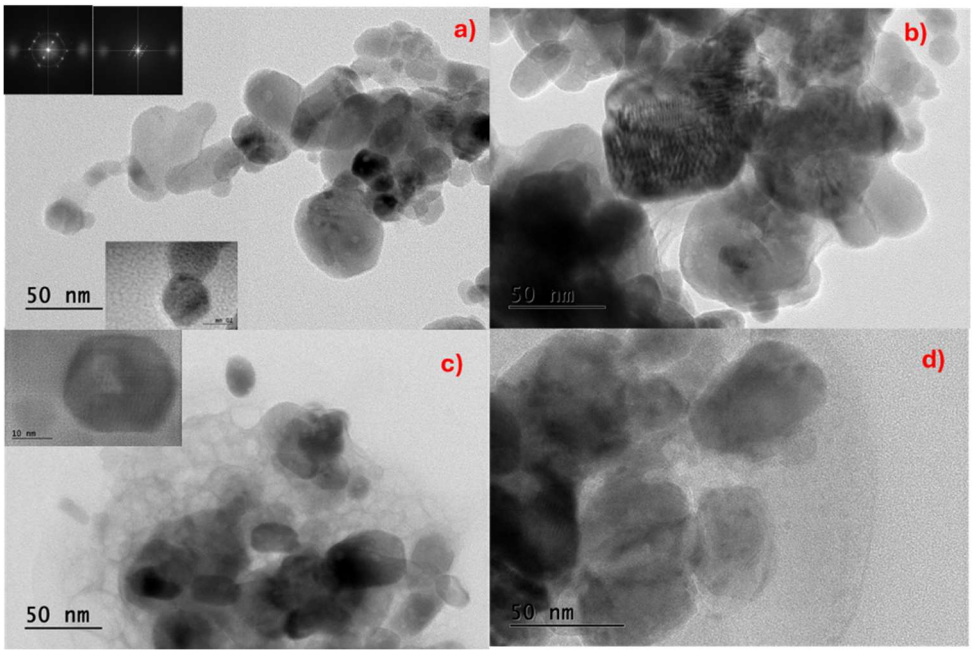


Fig. S9: TEM images showing the morphology for MgO:ZnO: (a) 1:1, (b) 1:3, (c) 1:5 and (d) 1:10.

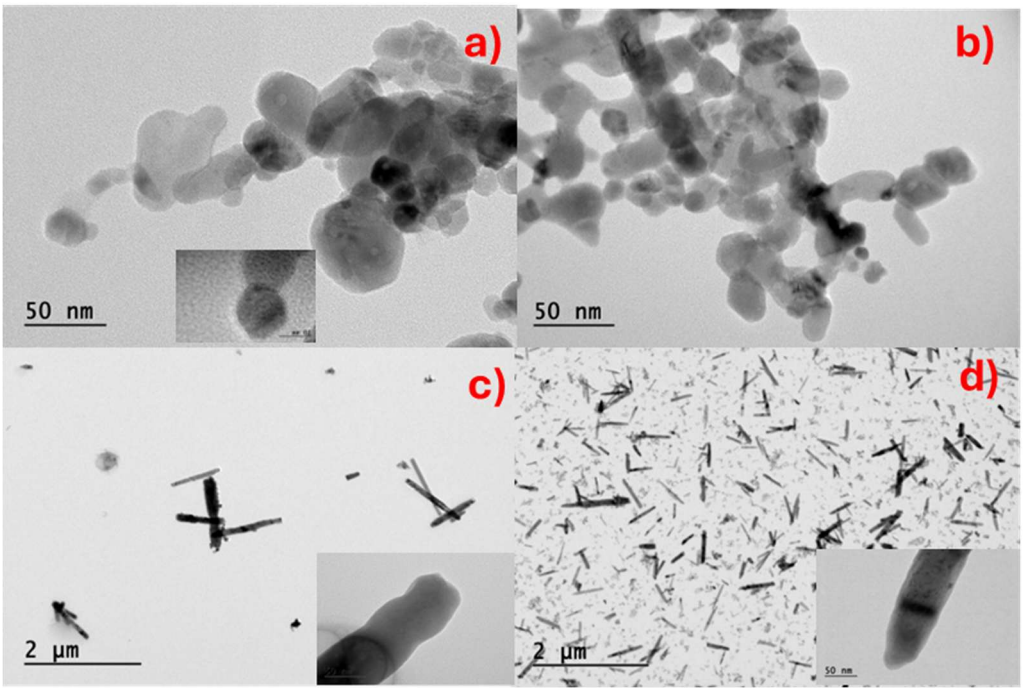


Fig. S10: TEM images showing the morphology for MgO:ZnO: 1:15 ((a) and (b)), 1:20 ((c) and (d)).

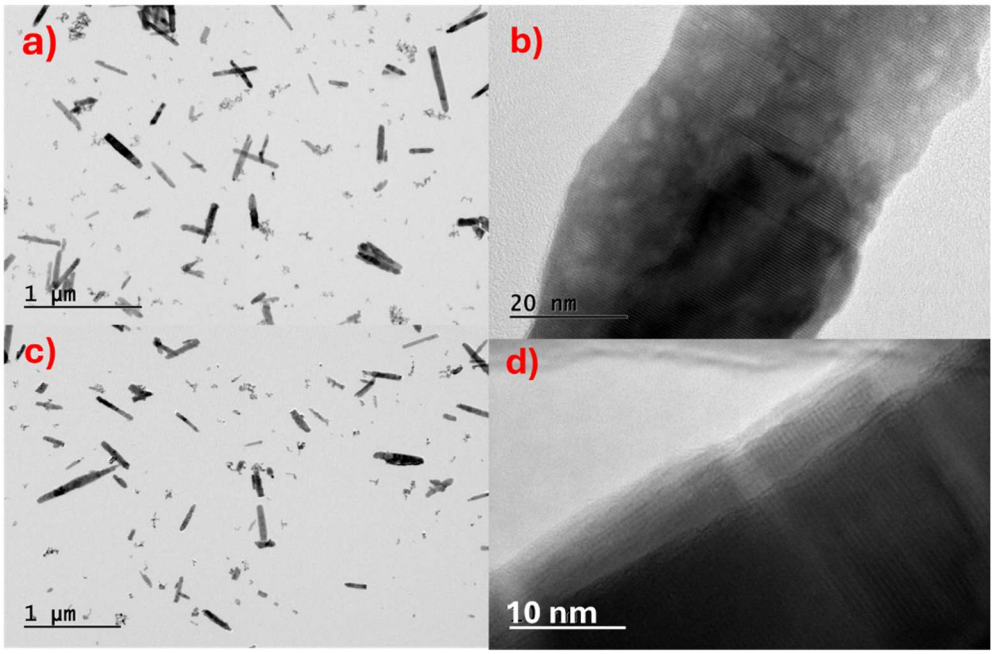


Figure S11: TEM and SEM images showing the morphology for MgO:ZnO 1:50.

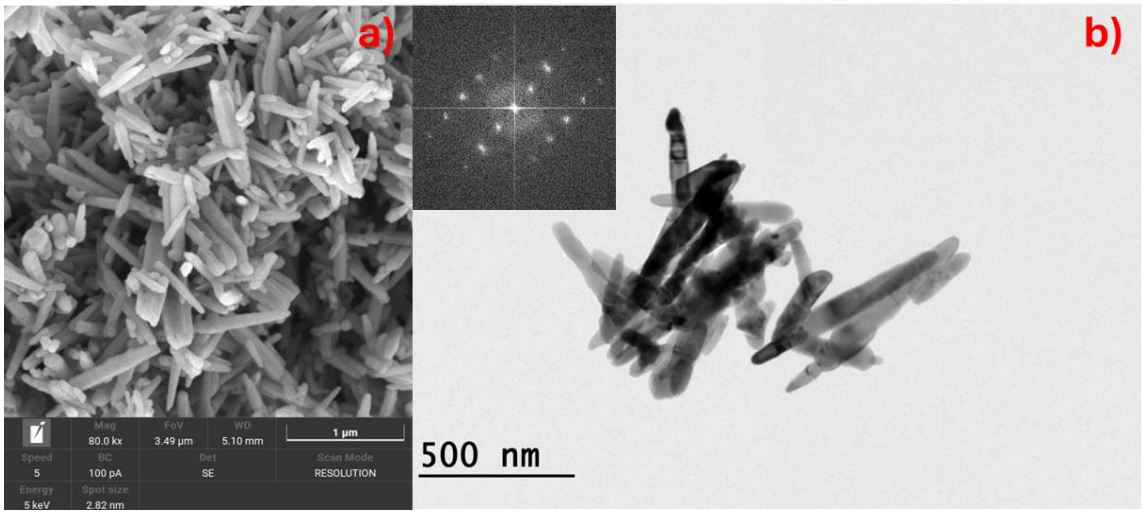


Figure S12: TEM and SEM images showing the morphology for MgO:ZnO 1:100.

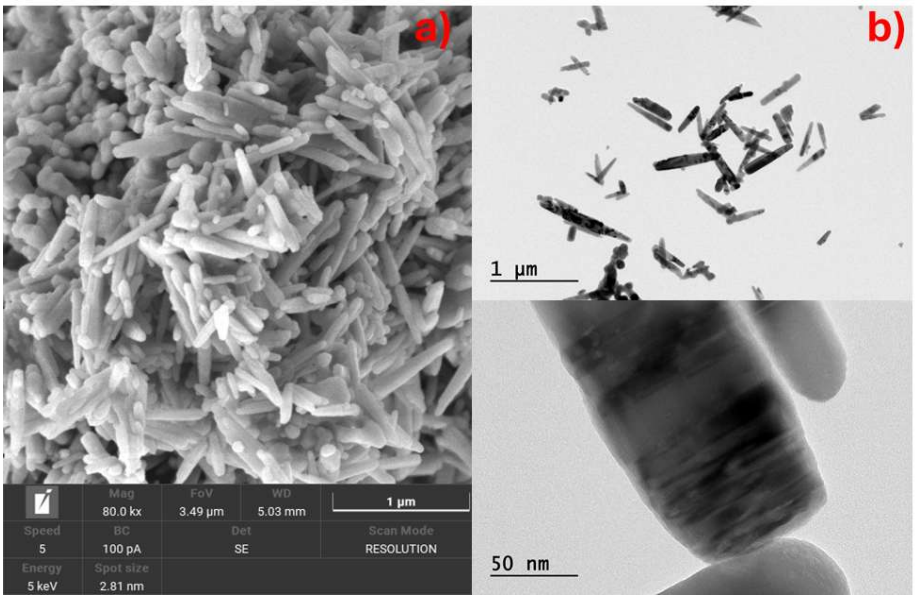


Figure S13: EDS/Atomic map density of MgO:ZnO 1:3.

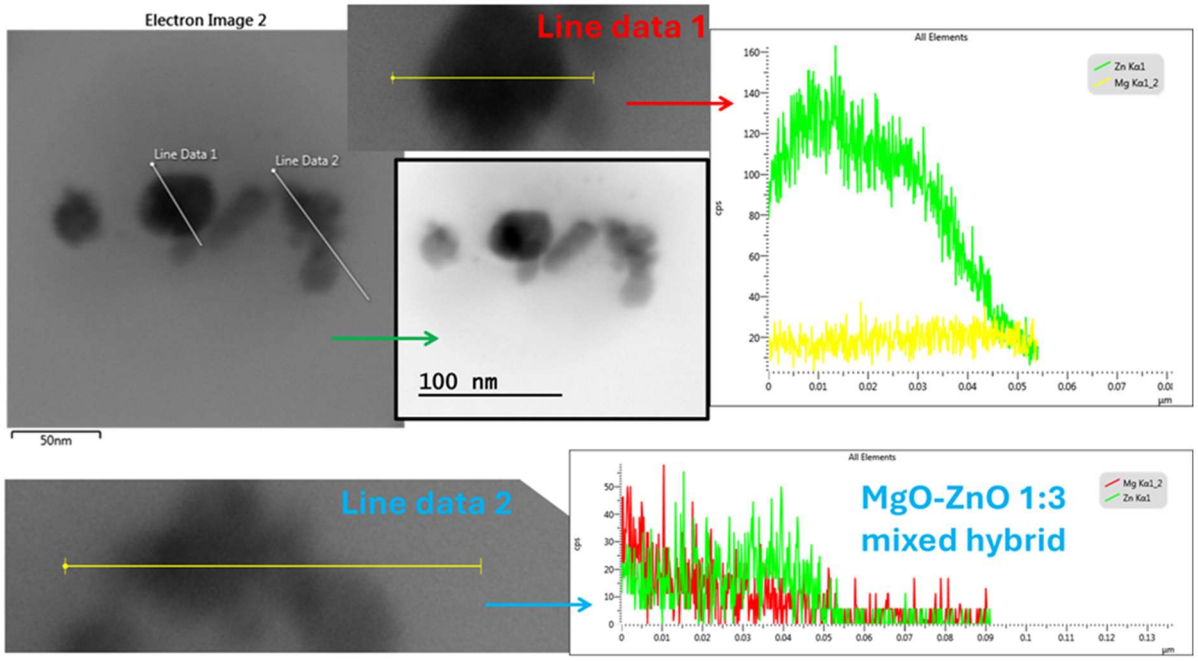


Figure S14: (a) Phase weight percentage (%) of samples and (b) Crystallite size.

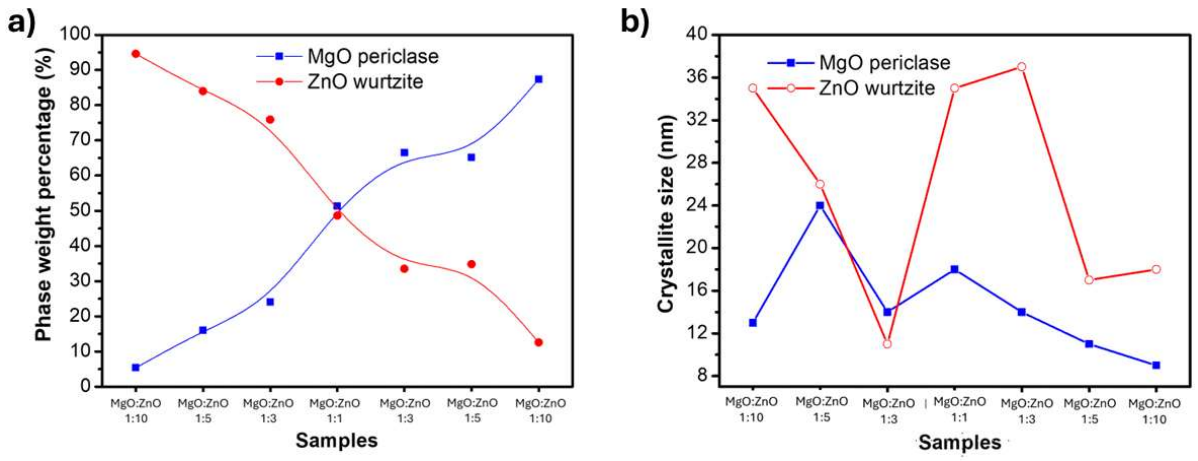


Figure S15: (a) Microstrain and (b) Dislocation density