Supporting Information

Nonmonotonous Size-dependent Photoluminescence and Excitonic Relaxations in

Nanostructured ZnO Thin Films

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Table S1 Particle mean size <d>, size distribution σ, grain size $d_{(101)}$, Lattice constants $a = b$ and c for Zn and ZnO phases and the internal parameter u, and parameters wRp and Rp for fitting the XRD patterns of the ZnO/ALO films based on the "F(calc) weighted" LaBail extraction analysis.

| T_A (°C) | SEM | | | Zn | | ZnO | | | wRp | Rp | $\chi 2$ |
	<d> (nm)	σ	$d_{(101)}$ ZnO (nm)	a = b (Å)	c (Å)	a = b (Å)	c (Å)	u			
RT	13.8(2)	0.16(2)	2.1	2.6533(11)	5.1315(16)	3.2358(11)	5.2442(3)	0.3769	0.2638	0.1538	6.132
100	13.3(2)	0.19(2)	5.3	2.6569(13)	5.0304(24)	3.2462(8)	5.2343(7)	0.3782	0.3403	0.2317	5.741
200	12.5(2)	0.21(2)	6.9			3.2514(8)	5.2191(2)	0.3794	0.2639	0.1794	4.989
300	13.6(2)	0.18(2)	8.1			3.2495(7)	5.2179(2)	0.3793	0.2492	0.1597	5.448
400	21.0(3)	0.20(2)	9.6			3.2525(6)	5.2151(5)	0.3797	0.3169	0.2233	4.235
500	32.8(7)	0.24(3)	16.0			3.2449(7)	5.2023(12)	0.3797	0.3092	0.204	3.878
600	64(4)	0.30(9)	26.4			3.2485(5)	5.2066(9)	0.3798	0.3743	0.2436	3.426
700	60(3)	0.34(6)	23.6			3.2509(2)	5.2106(2)	0.3797	0.3084	0.1907	4.043
800	65(8)	0.42(14)	28.8			3.2488(4)	5.2024(6)	0.3800	0.3515	0.2318	3.3

Table S2 Summary of the fitting parameters used for the deconvolution of PL spectra obtained from various ZnO films.

T_A	$d_{(101)}$	UV band (eV)		UV-Blue band (eV)		Green band (eV)		Orange band (eV)		Red band (eV)	
(°C)	(nm)	Xc	W	Xc	W	Xc	W	Xc	W	Xc	W
25 (RT)	2.1	3.268	0.138	2.98	0.091	2.333	0.243	1.995	0.178	1.703	0.058
100	5.3	3.297	0.166	2.937	0.075	2.353	0.231	2.033	0.203	1.699	0.06
200	6.9	3.286	0.097	3.192	0.201	2.412	0.254	2.023	0.206	1.685	0.049
300	8.1	3.26	0.082	3.144	0.162	2.465	0.225	2.092	0.246	1.662	0.038
400	9.6	3.246	0.078	3.133	0.17	2.463	0.207	2.107	0.251	1.664	0.039
500	16	3.25	0.066	3.145	0.136	2.471	0.18	2.307	0.291	1.648	0.035
600	26.4	3.252	0.058	3.171	0.113	2.437	0.213	2.038	0.251	1.644	0.028
700	23.6	3.259	0.055	3.188	0.104	2.464	0.159	2.325	0.254	1.645	0.032
800	28.8	3.25	0.058	3.17	0.111	2.448	0.178	2.327	0.332	1.643	0.029