

## Supporting Information

### Controlled synthesis of luminescent CIZS/ZnS/ZnS core/shell/shell nanoheterostructures

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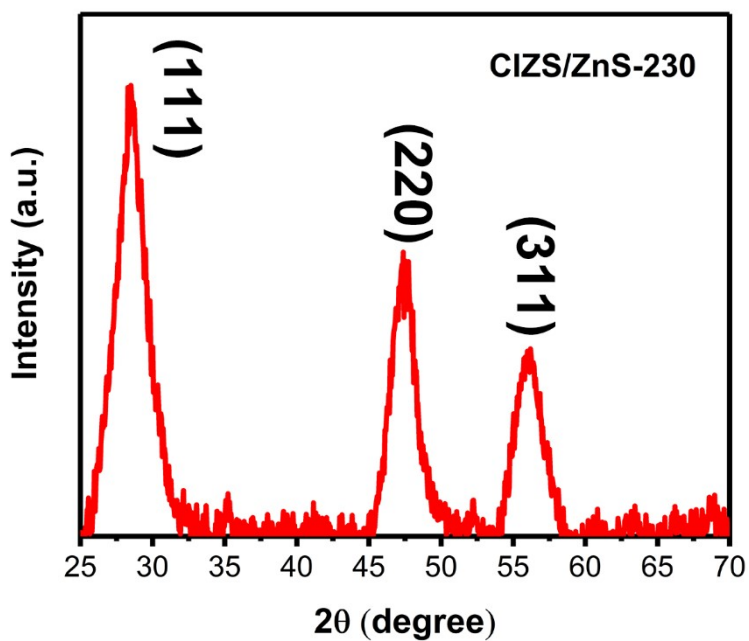


Figure S1. The X-ray powder diffraction pattern of CIZS/ZnS-230.

**Table S1.** Details of the PL lifetime of sample CIZS/ZnS-230 (CHISQ = 1.056, 3 exponential fitting).

Components	$t_1$	$t_2$	$t_3$
	1.426485E-07 sec	5.015957E-07 sec	2.104727E-08 sec
Amplitude	$B_1$	$B_2$	$B_3$
	0.2029	0.7791	0.0181

**Table S2.** Details of the PL lifetime of sample CIZS/ZnS-260 (CHISQ = 1.094, 3 exponential fitting).

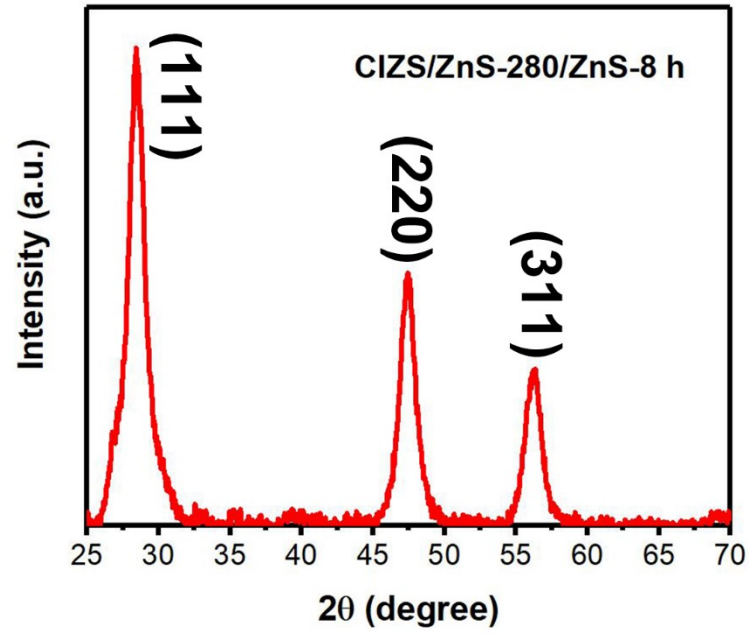
Components	$t_1$	$t_2$	$t_3$
	9.760929E-08 sec	5.032915E-07 sec	8.587953E-09 sec
Amplitude	$B_1$	$B_2$	$B_3$
	0.1445	0.8430	0.0126

**Table S3.** Details of the PL lifetime of sample CIZS/ZnS-280 (CHISQ = 1.084, 3 exponential fitting).

Components	$t_1$	$t_2$	$t_3$
	1.007718E-07 sec	6.081183E-07 sec	1.327636E-08 sec
Amplitude	$B_1$	$B_2$	$B_3$
	0.1341	0.8424	0.0235

**Table S4.** Details of the PL lifetime of sample CIZS/ZnS-280/ZnS-2 h (CHISQ = 1.072, 3 exponential fitting).

Components	$t_1$	$t_2$	$t_3$
	1.023656E-07 sec	6.595245E-07 sec	1.25553E-08 sec
Amplitude	$B_1$	$B_2$	$B_3$
	0.1156	0.8705	0.0139



**Figure S2.** The X-ray powder diffraction pattern of CIZS/ZnS-280/ZnS-8 h.

**Table S5.** Details of the PL lifetime of sample CIZS/ZnS-280/ZnS-4 h (CHISQ = 1.042, 3 exponential fitting).

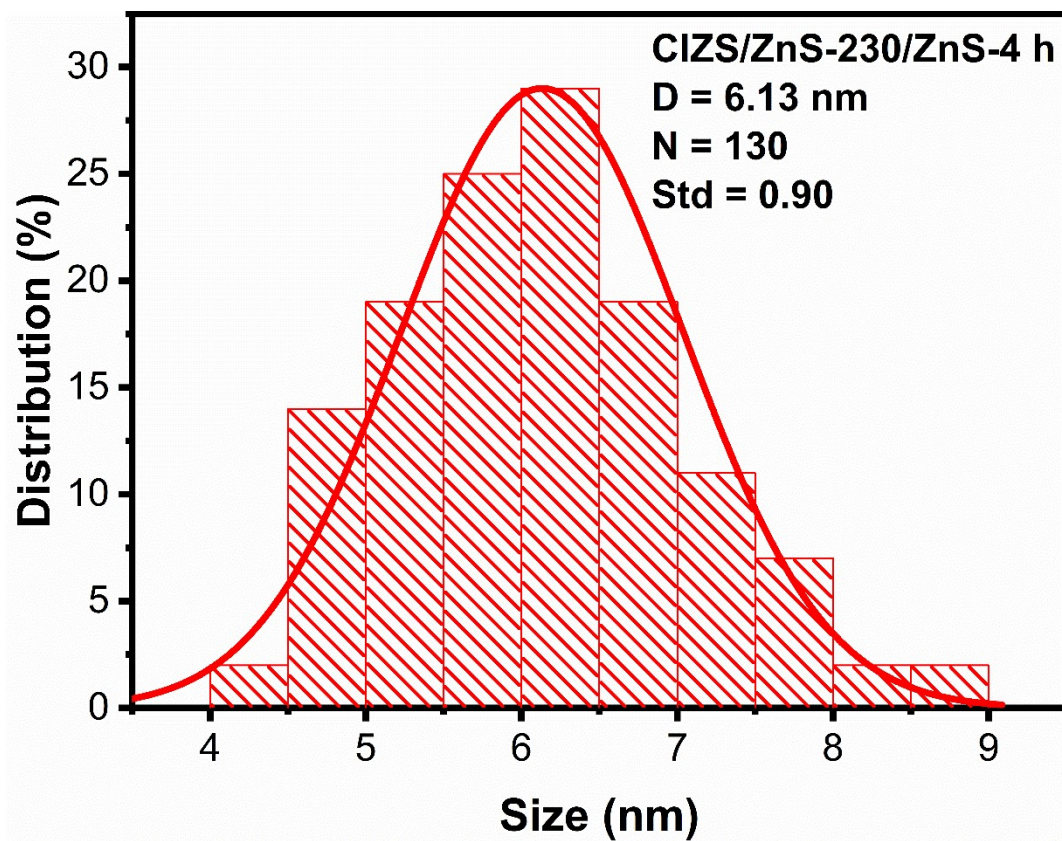
Components	$t_1$	$t_2$	$t_3$
	8.342819E-08 sec	6.770391E-07 sec	6.04293E-09 sec
Amplitude	B1	B2	B3
	0.0839	0.9085	0.076

**Table S6.** Details of the PL lifetime of sample CIZS/ZnS-280/ZnS-8 h (CHISQ = 1.7096, 3 exponential fitting).

Components	$t_1$	$t_2$	$t_3$
	8.057041E-08 sec	6.622875E-07 sec	5.033062E-09 sec
Amplitude	$B_1$	$B_2$	$B_3$
	0.0848	0.9082	0.007

**Table S7.** Details of the PL lifetime of sample CIZS/ZnS-230/ZnS-8 h (CHISQ = 1.072, 3 exponential fitting).

Components	$t_1$	$t_2$
	8.850976E-08 sec	4.710311E-07 sec
Amplitude	$B_1$	$B_2$
	0.1165	0.8835



**Figure S3.** The size distribution histogram of CIZS/ZnS-230/ZnS-4 h.