Rapid Crystallization of All-Inorganic $CsPbBr_3$ Perovskite for High-Brightness Light-Emitting Diodes – Supporting Information

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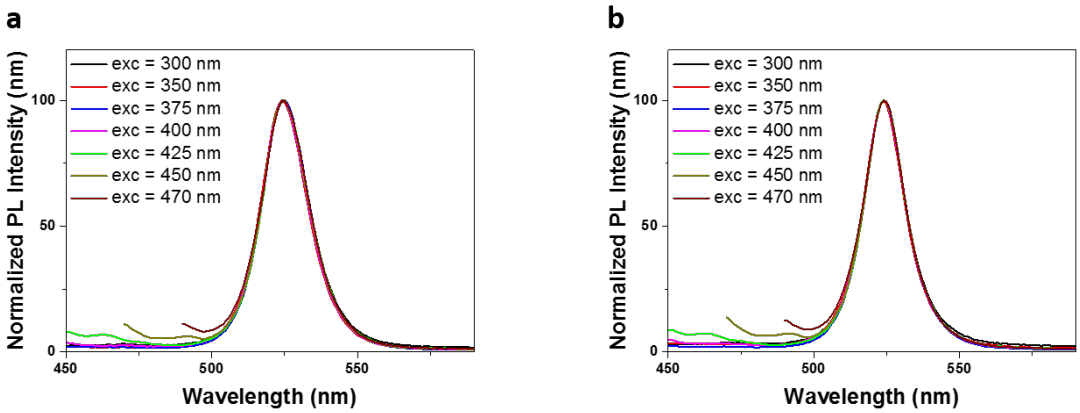

Figure S1. PL spectra as a function of excitation wavelengths for (a) conventional and (b) N_2-facilitated $CsPbBr_3$ films.

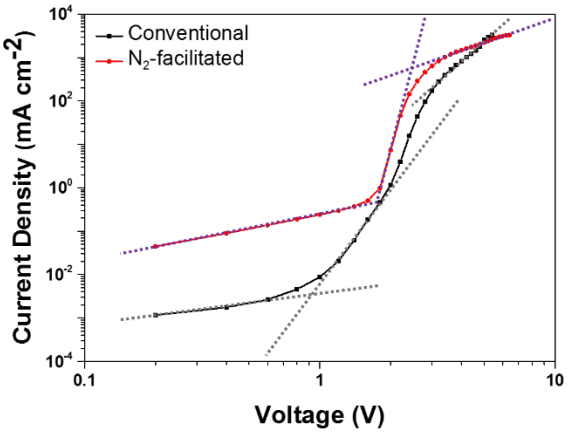

Figure S2. Log J vs log V plot of conventional (black) and N_2-facilitated (red) PeLEDs showing various regions of conduction regimes.

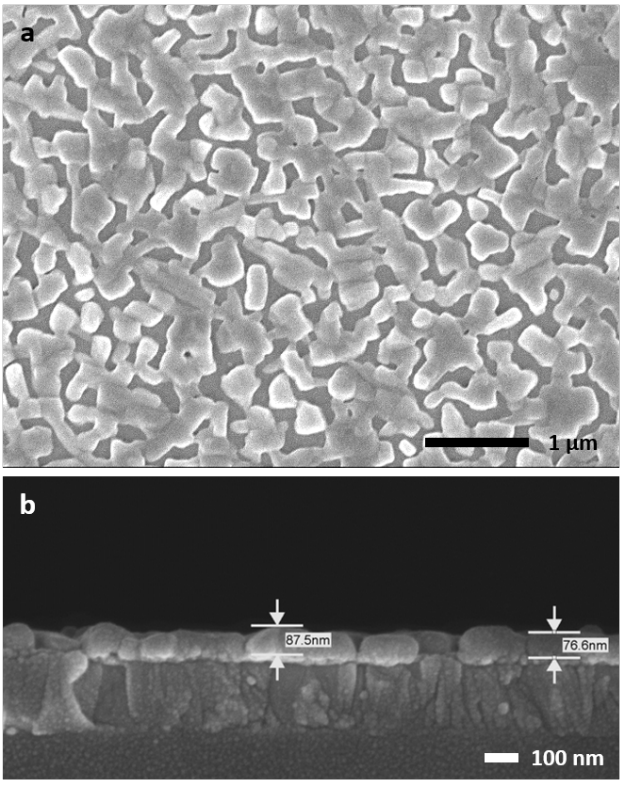

Figure S3. (a) Surface and (b) cross-sectional FESEM of conventionally spin-coated $CsPbBr_3$ films with increased spin speed at 5000 rpm.

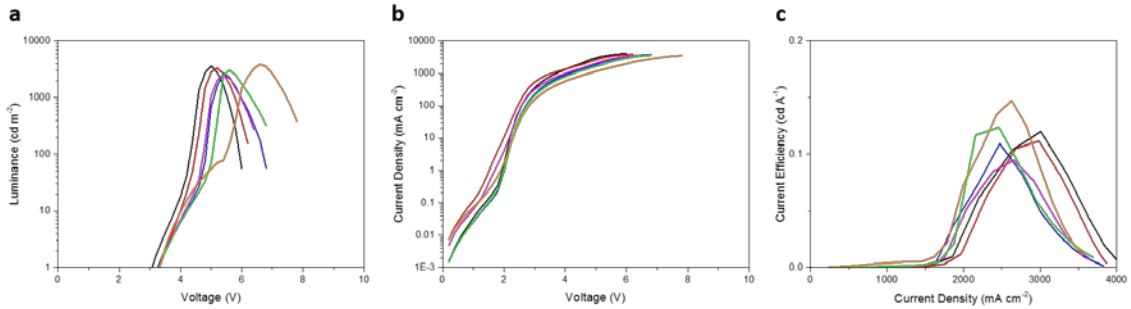

Figure S4. (a) Luminance and (b) current density versus driving voltage, and (c) current efficiency versus current density of devices fabricated using conventional spin-coating method at higher spin speed of 5000 rpm.

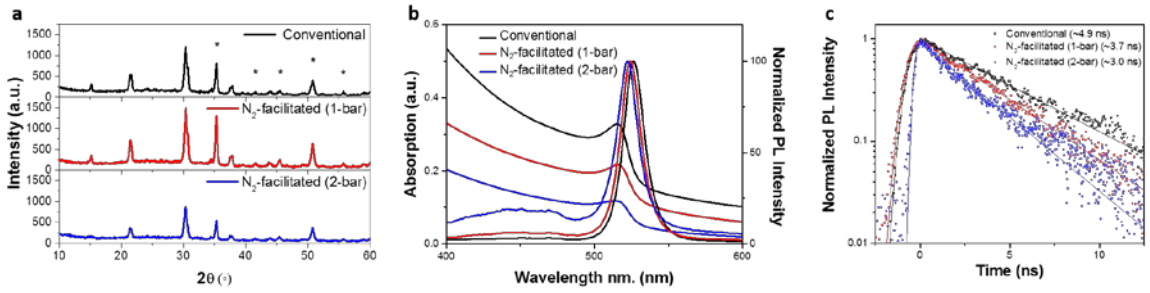

Figure S5. (a) XRD, (b) absorption and PL spectra, and (c) TRPL decay curves of $CsPbBr_3$ films deposited using conventional (black), 1-bar (red) and 2-bar N_2-facilitated (blue) method.

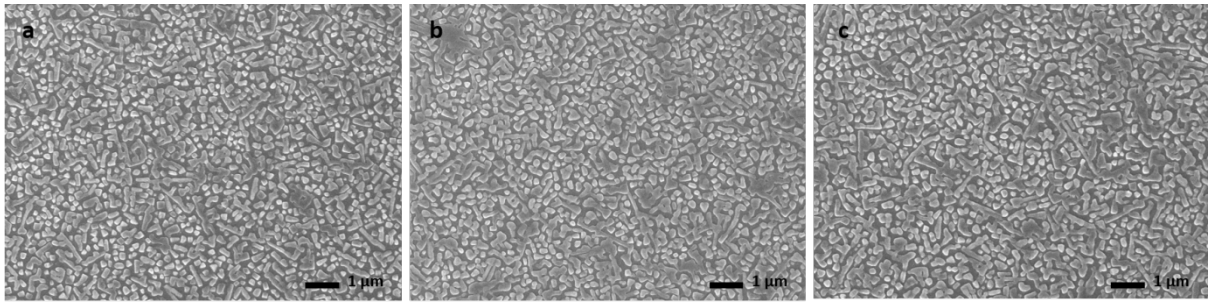

Figure S6. Surface FESEM images of $CsPbBr_3$ films deposited on ITO/PEDOT:PSS substrates with N_2 flow introduced at (a) 1 s, (b) 3 s, and (c) 5 s from initiation of spin coating.

Table S1. Comparison of device performance of $CsPbBr_3$ PeLEDs spin-coated using conventional (4000 and 5000 rpm) and N_2-facilitated method with N_2 flow introduced at various timings and pressures.

Sample	Luminance (cd m^{-2})		V_{th} (V)		Current Efficiency (cd A^{-1})	
	Best	Average	Best	Average	Best	Average
Conventional (4000 rpm)	2964	2274	2.6	3.2	0.118	0.084
Conventional (5000 rpm)	3615	3184	3.1	3.3	0.120	0.118
N_2-facilitated (1-bar) at 1s	6810	6231	2.5	2.7	0.240	0.205
N_2-facilitated (1-bar) at 3s	**8218**	**6863**	**2.4**	**2.7**	**0.718**	**0.339**
N_2-facilitated (1-bar) at 5s	8156	6509	2.4	2.6	0.246	0.220
N_2-facilitated (2-bar)	2617	1601	3.1	3.4	0.135	0.133

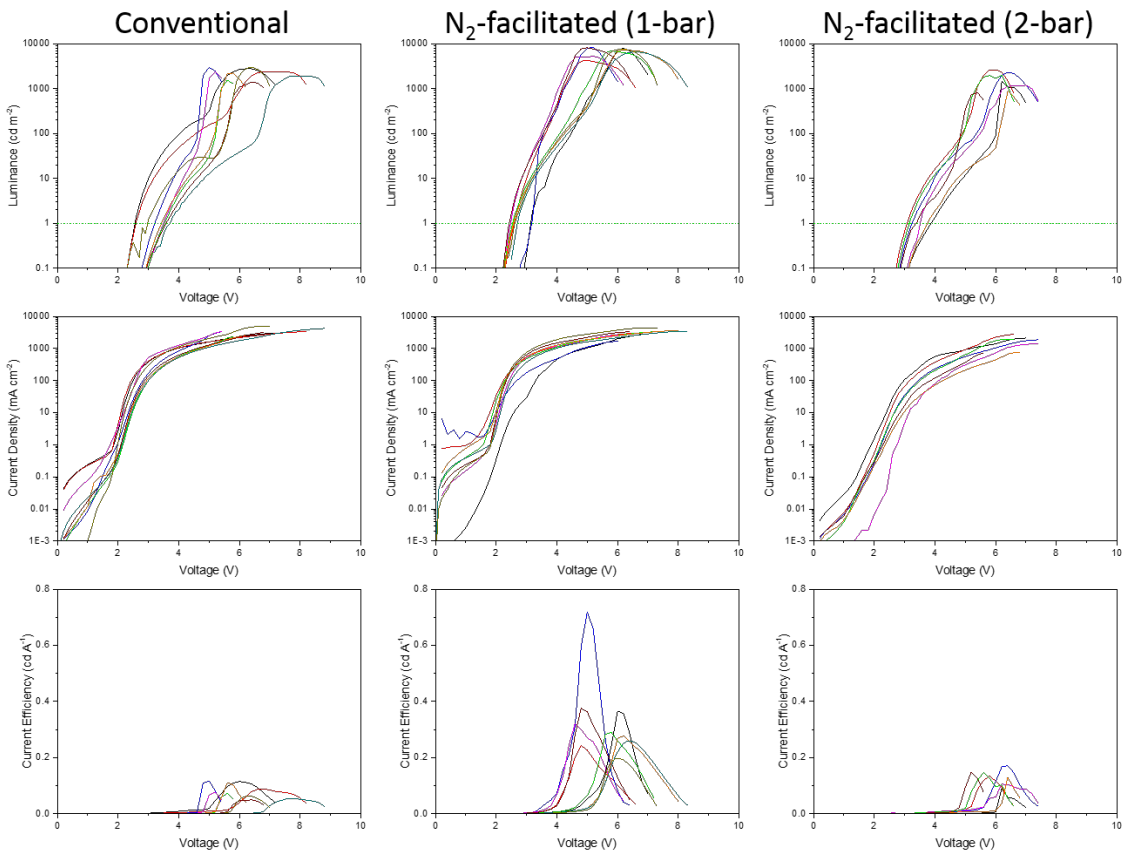

Figure S7. Luminance (top row), current density (middle row), and current efficiency (bottom row) versus driving voltage of all devices made using conventional (left), 1-bar (centre), and 2-bar N_2-facilitated (right) methods.

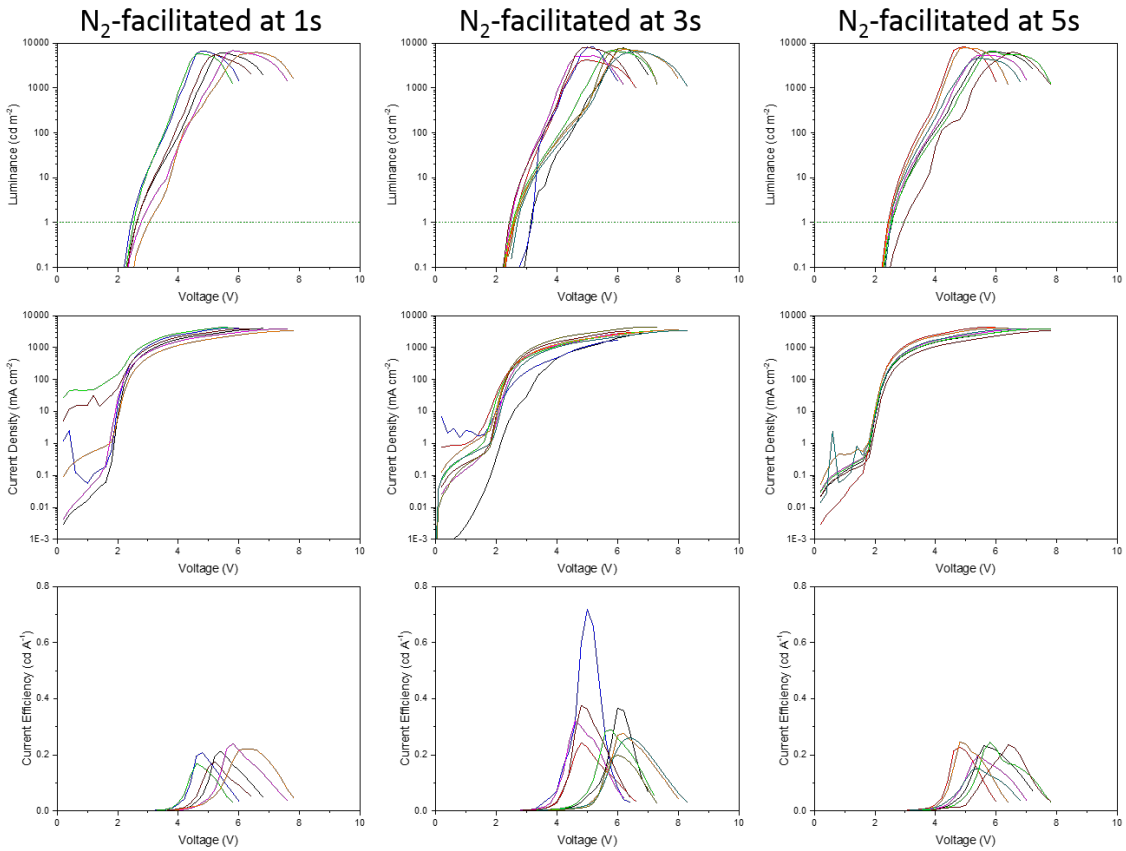

Figure S8. Luminance (top row), current density (middle row), and current efficiency (bottom row) versus driving voltage of all devices made using N_2-facilitated method with introduction of N_2 flow at different timings.