Electronic Supplementary Material (ESI) for Journal of Materials Chemistry C.

Recyclability of $CsPbBr_3$ Quantum Dot Glass Nanocomposites for Their Long-Standing Use in White LEDs

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1. Supplementary Figures

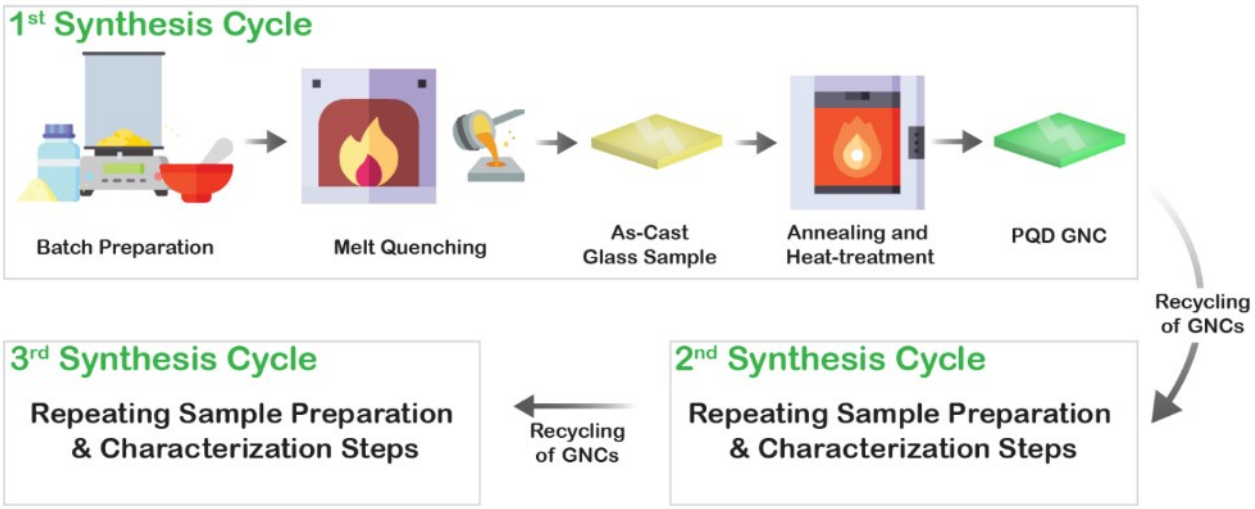


Fig. S1 Schematic illustration of applied synthesis and recycling processes for PQD GNCs

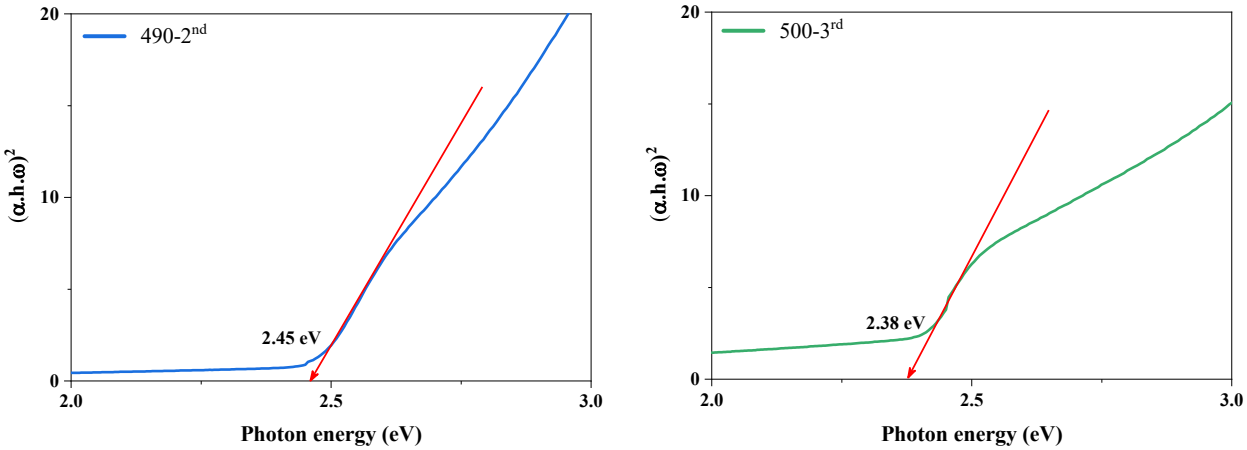


Fig. S2 Tauc plots of recycled PQD GNCs

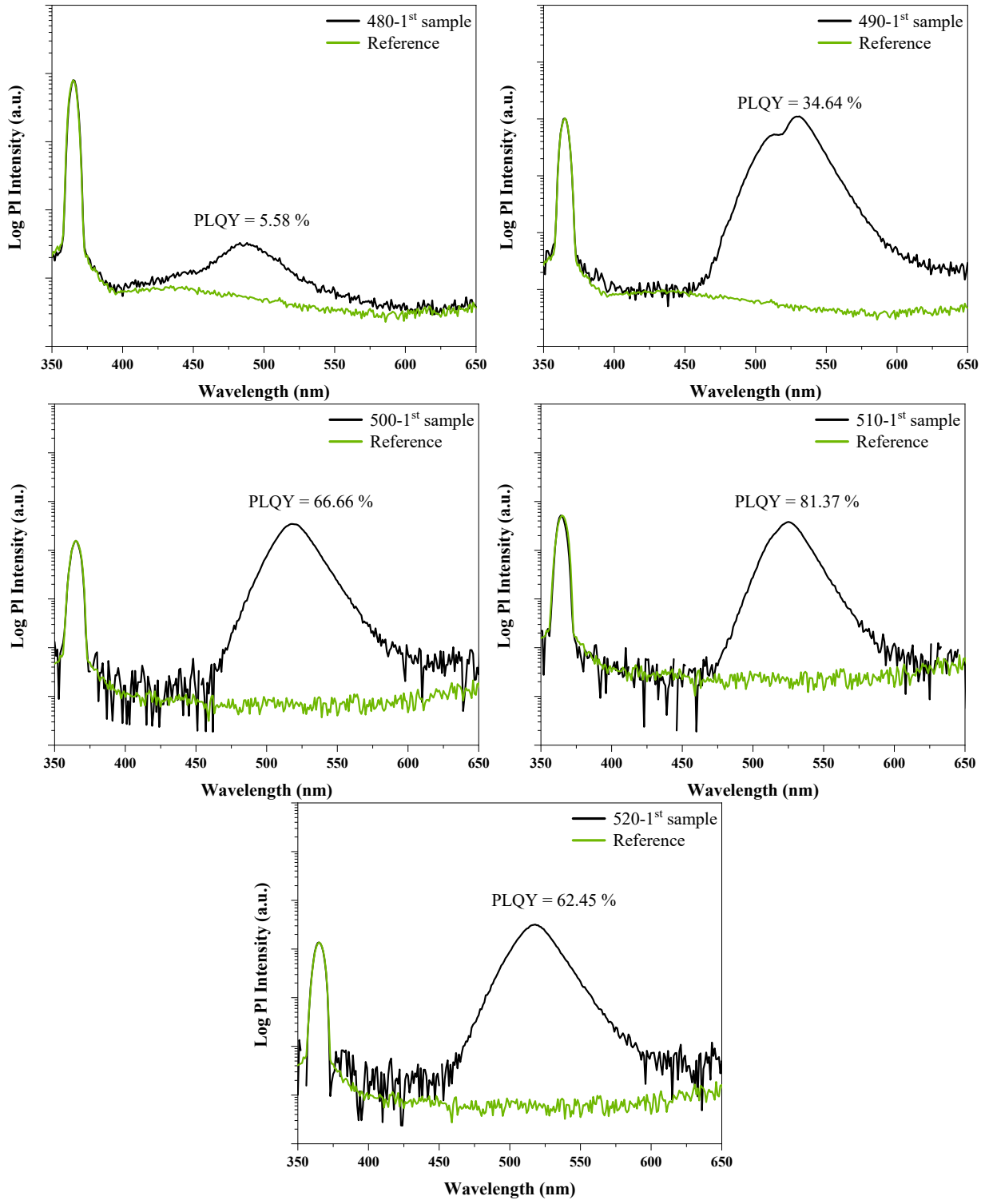


Fig. S3 PLQY mapping of PQD GNCs from the 1st synthesis cycle. (Samples are excited at 360 nm and PLQY values are indicated in each plot.)

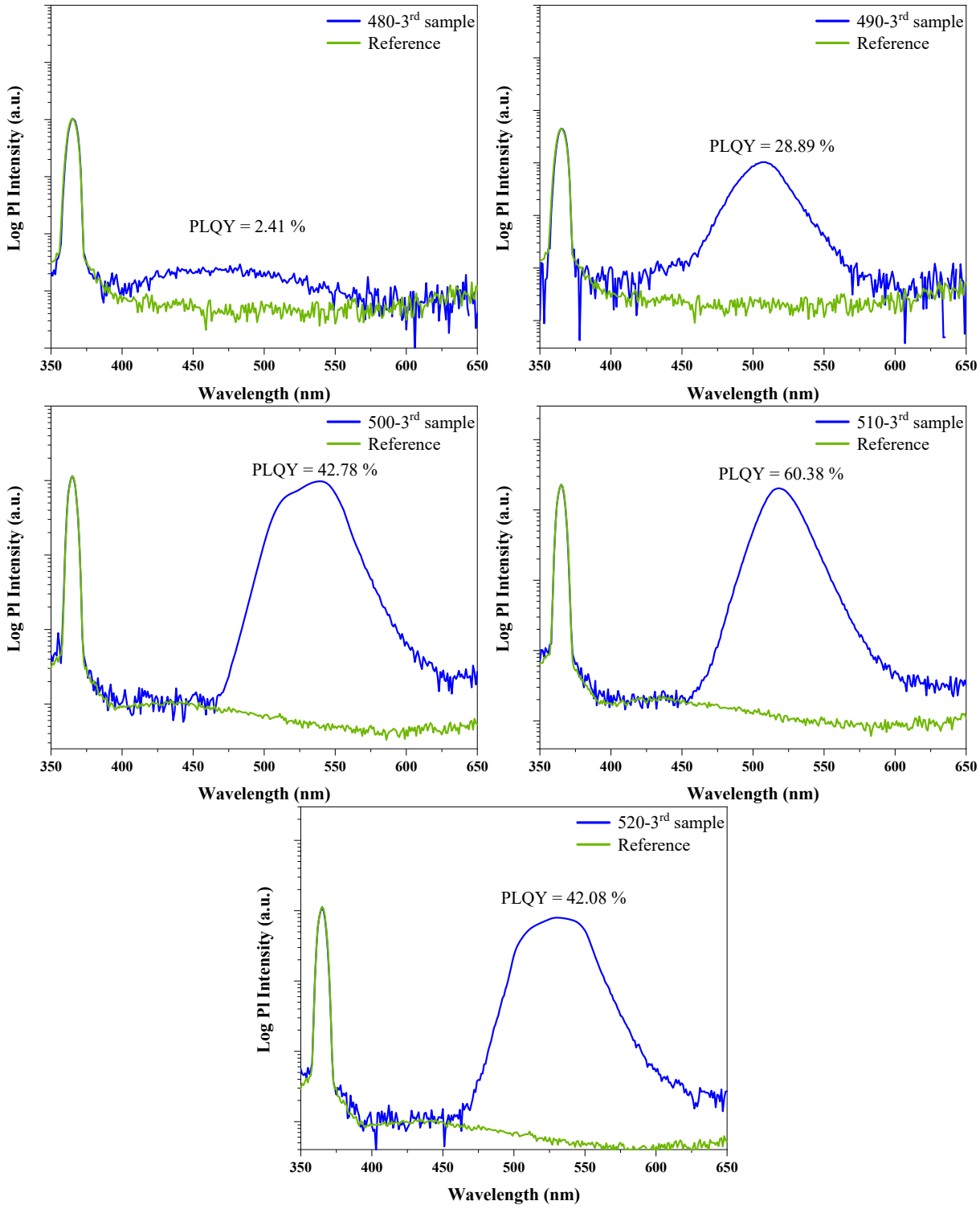


Fig. S4 PLQY mapping of PQD GNCs from the 3rd synthesis cycle. (Samples are excited at 360 nm and PLQY values are indicated in each plot.)

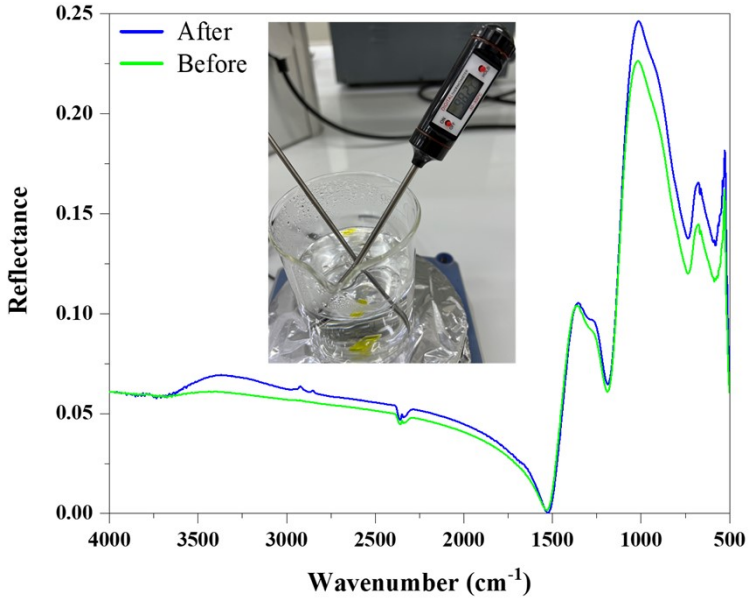
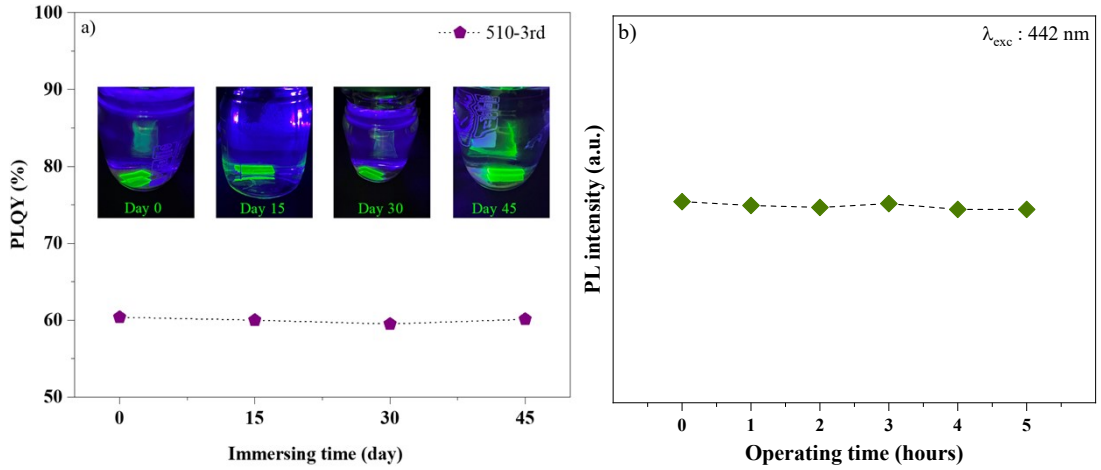


Fig. S5 FTIR spectrum of 510-3rd sample before and after immersing in boiling water for 4 h (inset shows the temperature during the boiling process)



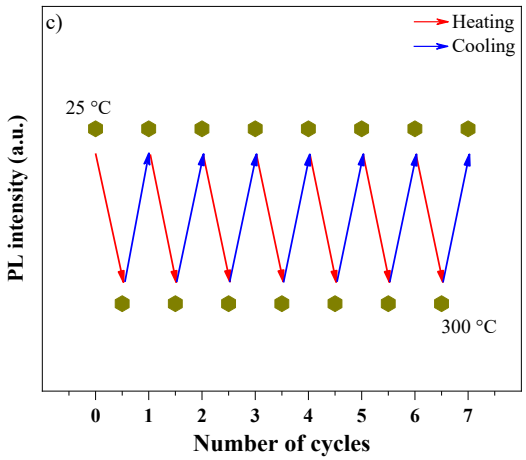


Fig. S6 (a) Chemical stability test by immersion in water for 45 days (b) Photostability test under 442 nm laser operating at 500 mW (c) heating-cooling cycle test from 25 °C to 300 °C

2. Supplementary Tables

Table S1 Nominal and final chemical compositions of as-cast samples for the first and third synthesis cycle

Element	Nominal composition (at%)	Final compositions (at%)	
		1st synthesis cycle	3rd synthesis cycle
Si	10.08	9.38	8.83
B	17.29	17.29*	17.29*
Zn	3.45	3.49	3.61
Ca	1.44	1.45	1.64
Al	1.15	1.15*	1.15*
Na	3.45	3.17	2.94
Cs	4.03	3.62	3.39
Pb	1.72	1.65	1.58
Br	2.59	2.15	1.75
O	54	56.65	57.82

*: Compositions of these elements are taken constant as in the nominal glass composition

Table S2 CIE color coordinates of PQD GNCs

Synthesis Cycle	Sample	x	y
1st synthesis cycle	480-1st	0.1196	0.2139
	490-1st	0.1299	0.7856
	500-1st	0.2069	0.7620
	510-1st	0.2427	0.7371
	520-1st	0.2598	0.7243
2nd synthesis cycle	480-2nd	0.1339	0.1940
	490-2nd	0.0860	0.4162
	500-2nd	0.0638	0.5527
	510-2nd	0.0817	0.7348
	520-2nd	0.0974	0.7337
3rd synthesis cycle	480-3rd	0.1298	0.1890
	490-3rd	0.1084	0.3226
	500-3rd	0.0679	0.4884
	510-3rd	0.0589	0.5957
	520-3rd	0.0888	0.7369

Table S3 Observed FTIR band positions for 510-3rd sample

Wavenumber (cm^{-1})	Band assignments
680	bending vibrations of bridging oxygen in BO_3 units [1,2]
918	B–O stretching vibrations in BO_4 units and also stretching frequency of Si–O–B [1,3]
1023	B–O stretching vibrations in BO_4 units [3]
1260	B–O stretching vibrations in BO_3 units [4]
1352	B–O stretching vibrations in BO_3 units [4]
3200-3600 (broad)	Molecular water [1,5,6]

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