Supplementary Information

Tunable Stokes Shift and Circular Polarized Luminessence by Supramolecular Gel

Hirokuni Jintoku,[a] Min-Tzu Kao,[b] André Del Guerzo,[b] Yudai Yoshigashima,[a] Takuya Masunaga,[a] Makoto Takafuji[a, c] and Hirotaka Ihara[a, c]*

[a] Department of Applied Chemistry & Biochemistry, Kumamoto University, Kumamoto 860-8555, Japan

[b] Université de Bordeaux, CNRS, Institut des Sciences Moléculaires - UMR 5255, NEO Nanostructures Organiques, 33400 Talence, France

[c] Kumamoto Institute for Photo-Electro Organics (PHOENICS), Kumamoto, 862-0901, Japan

Table S1. Absorption maxima, fluorescence maxima and quantum yield of the anthracene derivatives.

	λ_{abs} / nm [a]	λ_{FL} / nm		Φ_{FL} [b]	
		solution[a]	solid	solution[a]	solid
9-Phenylanthracene[c]	384	395	435	0.58	0.32
9,10-Diphenylanthracene[c]	395	412	455	0.92	0.65
***g*-PA**	384	423	537	0.68	0.22
***g*-PA-2**	387	422	504	0.75	0.15
***g*-DPA**	393	417	466	0.89	0.04

[a] 10 μM in chloroform. [b] Φ_{FL} values were measured using a fluorescence quantum yield measurement system (FP-8600, ILF-835 100 mm dia. integrating sphere, JASCO). [c] Commercialized product.

Table S2. Solubility and gelation properties of anthracene-derivatives

solvent	***g*-PA**	***g*-PA-2**	***g*-DPA**
water	I	I	I
dimethylsulfoxide	S	S	S
acetonitrile	G_T	I	I
dimethylformamide	S	S	S
methanol	S	I	S
ethanol	S	S	S
pyridine	S	S	S
tetrahydrofuran	S	S	S
ethyl acetate	G	S	S
chloroform	S	S	S
toluene	S	G_T	S
benzene	S	S	S
cyclohexane	G	G	G_P
n-hexane	I	I	I
n-hexane/THF (20 : 1)	G	P	P
n-hexane/THF (50 : 1)	G	P	P

Concentration: 1 mM, temperature: 25 ˚C

G: clear gel, G_T: turbid gel, G_P: partial gel, S: soluble, and I: insoluble when heated.

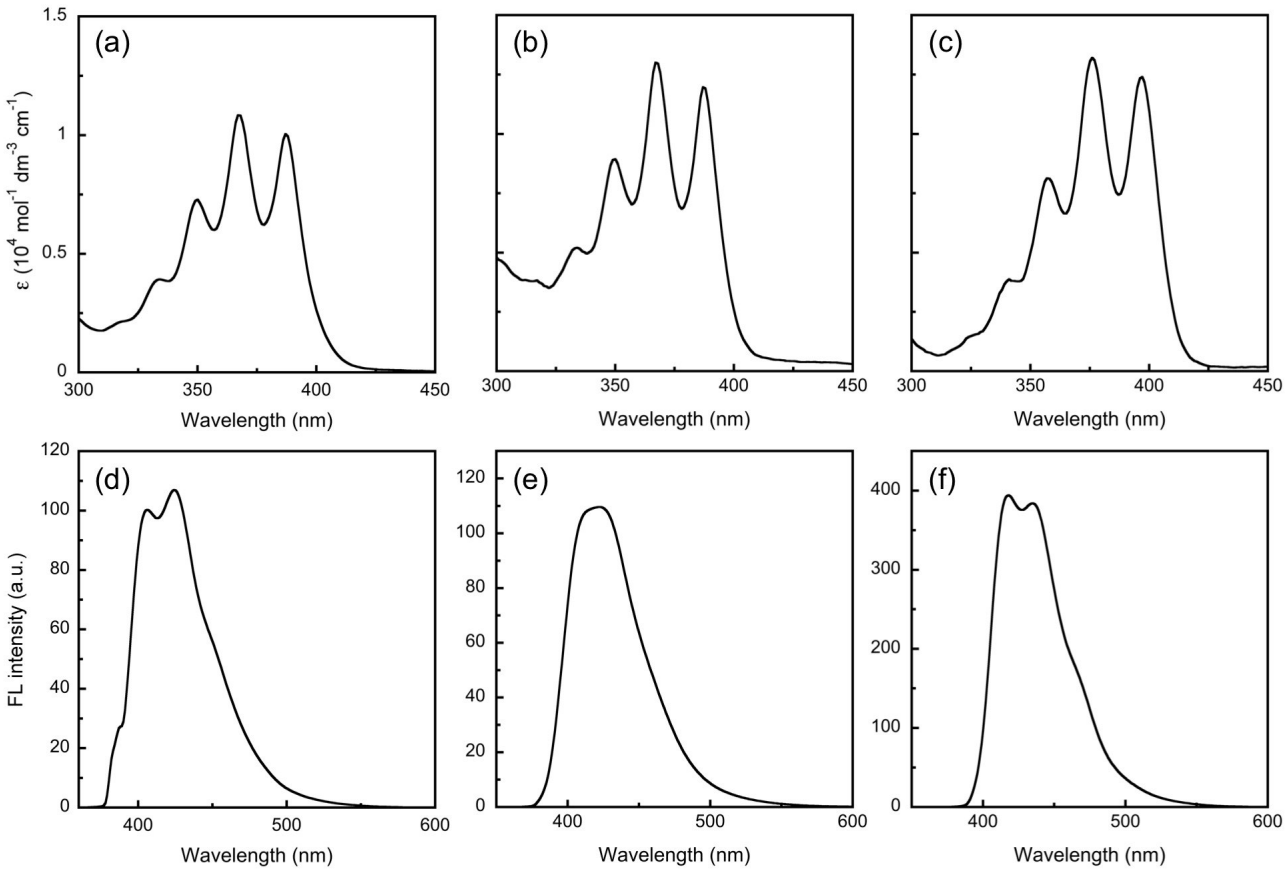

Figure S1. UV-vis and fluorescence spectra of (a, d) ***g*-PA**, (b, e) ***g*-PA-2**, and (c, f) ***g*-DPA** in chloroform at 25 °C. Concentrations: 10 μM. The excitation wavelengths are 385 nm (***g*-PA**), 385 nm (***g*-PA-2**), and 396 nm (***g*-DPA**).

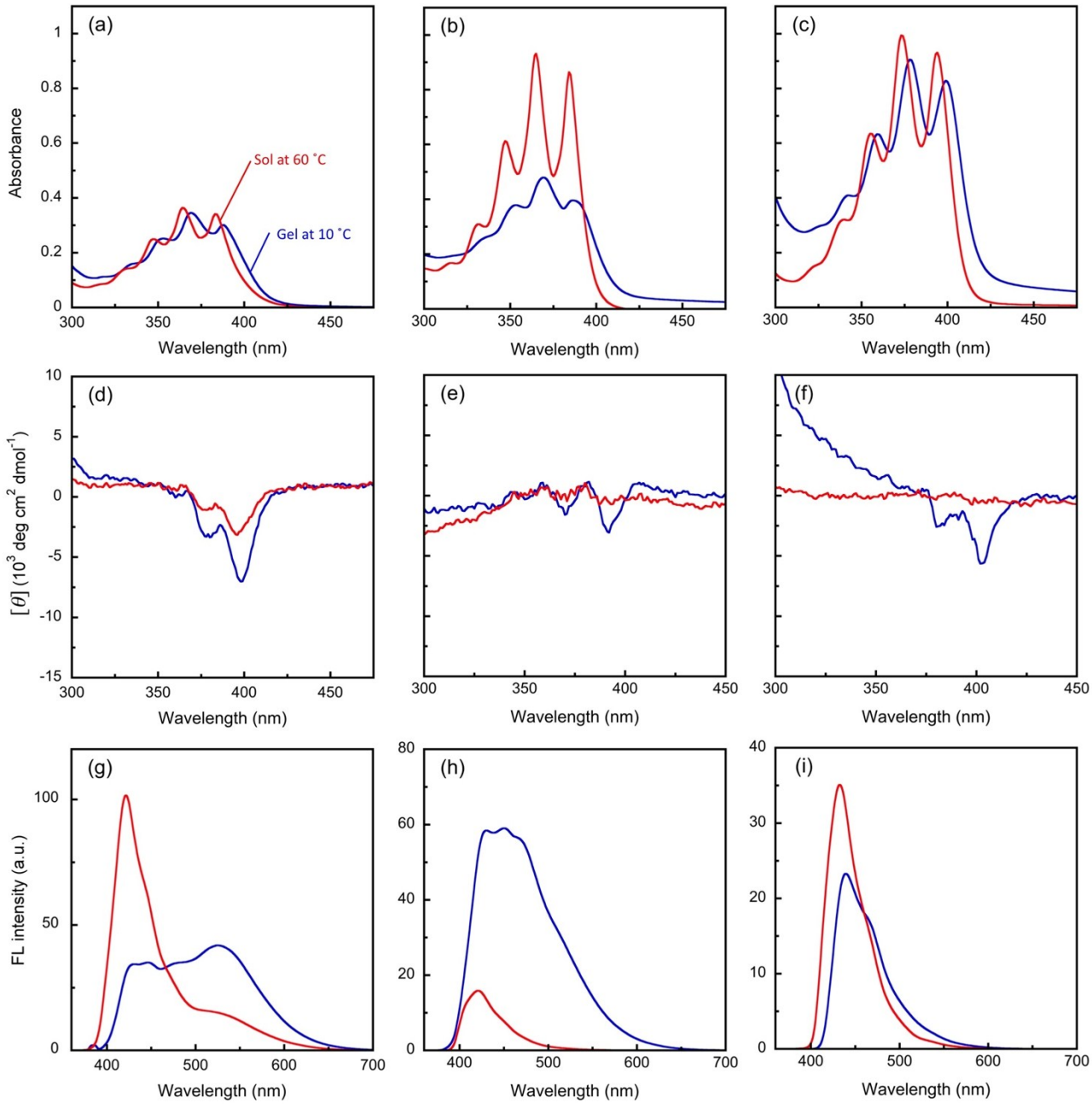

Figure S2. UV-vis, CD and fluorescence spectra of (a, d, g) ***g*-PA** in *n*-hexane/THF (50 : 1), (b, e, h) ***g*-PA-2** in cyclohexane, and (c, f, i) ***g*-DPA** in cyclohexane at 10 °C and 60 °C. Concentration: 1 mM. The excitation wavelengths are 385 nm (***g*-PA** and ***g*-PA-2**) and 396 nm (***g*-DPA**).

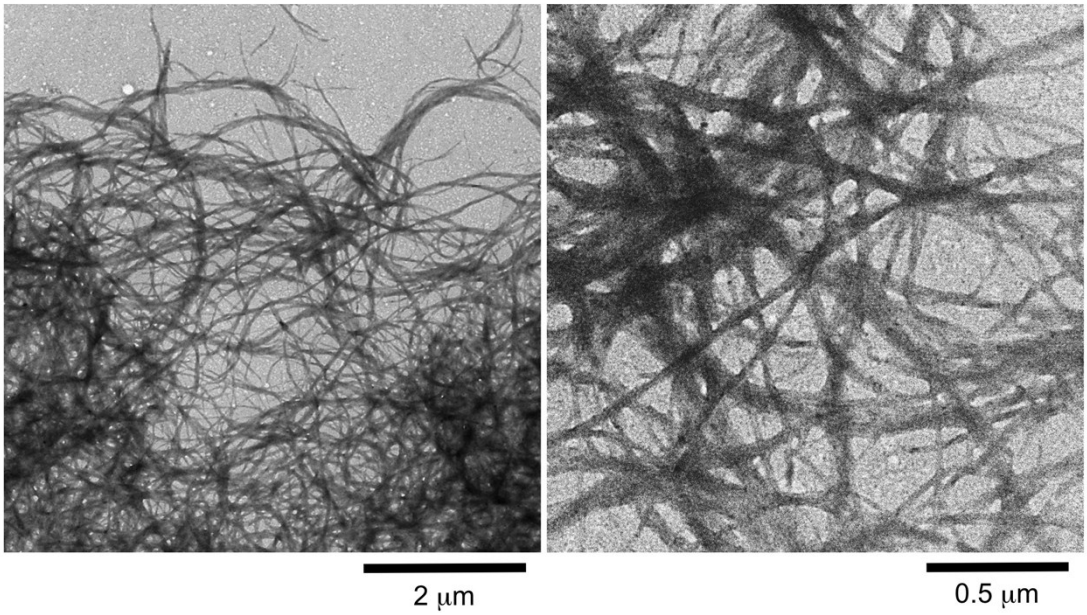

Figure S3. TEM images of ***g*-PA** aggregates that was prepared from 2 mM of *n*-hexane/THF (50 : 1) mixed gel at 25 ˚C. It was stained by 1 wt% of uranyl acetate.

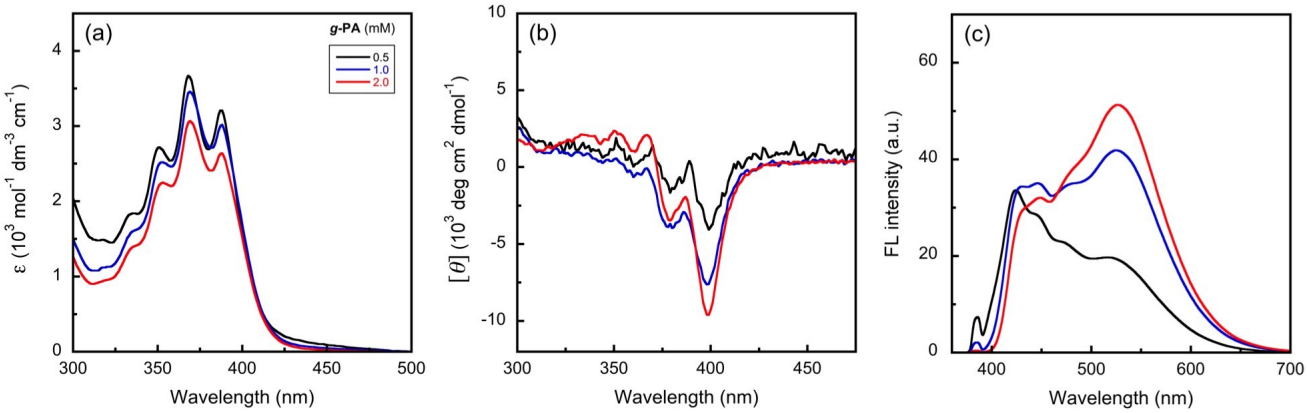

Figure S4. Concentration dependent (a) UV-vis, (b) CD and (c) fluorescence spectra of ***g*-PA** in *n*-hexane/THF (50 : 1) at 10 °C. The excitation wavelength is 385 nm.

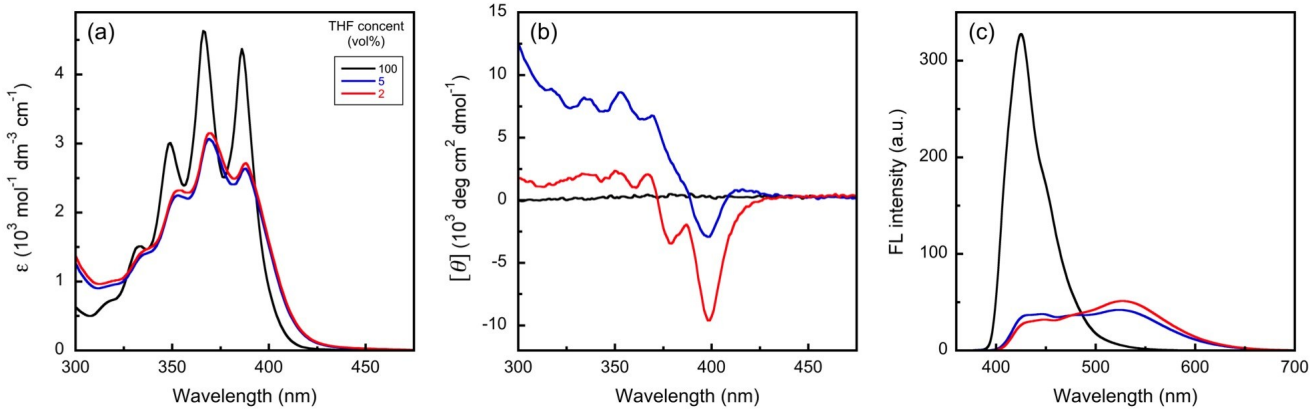

Figure S5. (a) UV-vis, (b) CD and (c) fluorescence spectra of ***g*-PA** in *n*-hexane/THF mixtures at 10 °C. Black line: THF, blue line: *n*-hexane/THF (20 : 1), and red line: *n*-hexane/THF (50 : 1). The excitation wavelength is 385 nm.

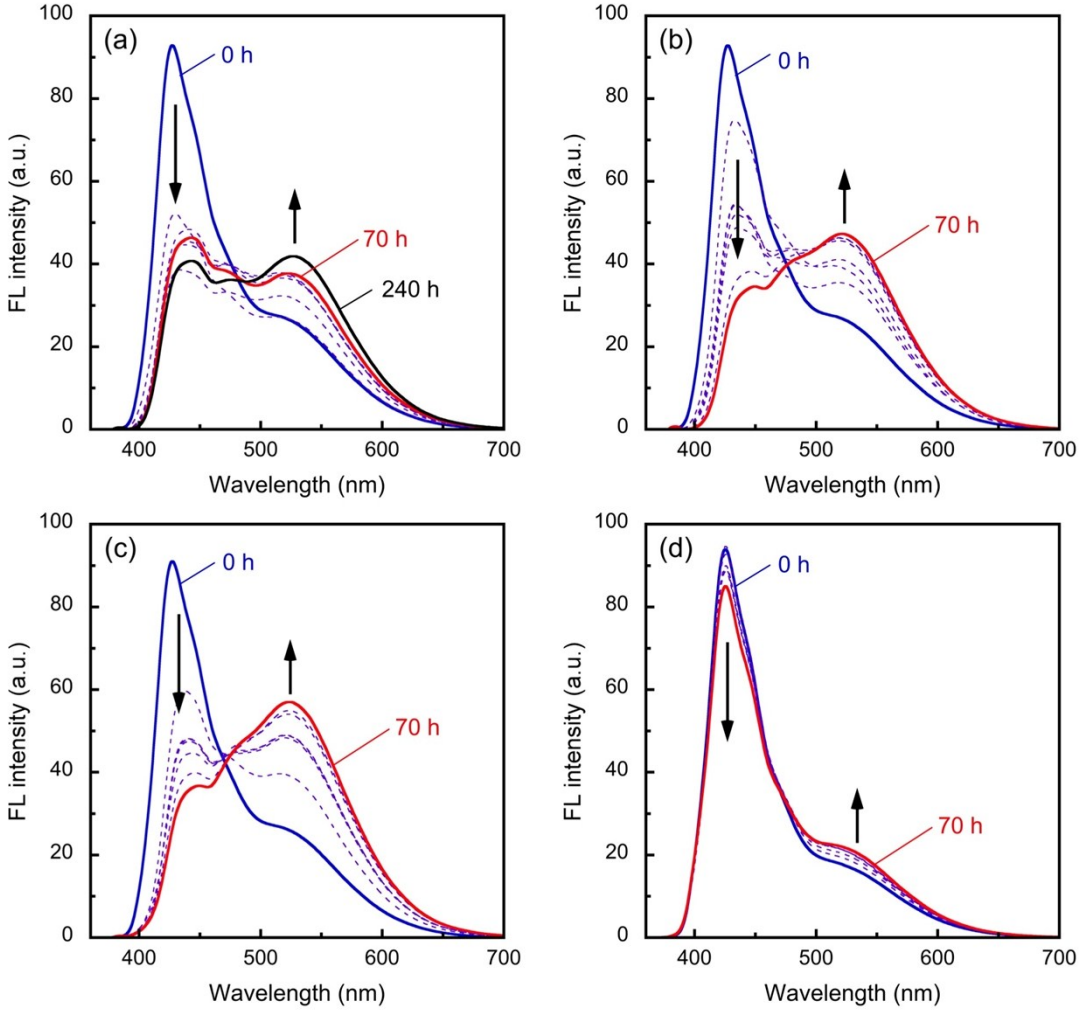

Figure S6. Time-course of fluorescence spectral changes of ***g*-PA** in a *n*-hexane/THF (50 : 1) mixture at (a) 10 °C, (b) 25 °C, (c) 35 °C, and (d) 45 °C. The excitation wavelength is 385 nm.

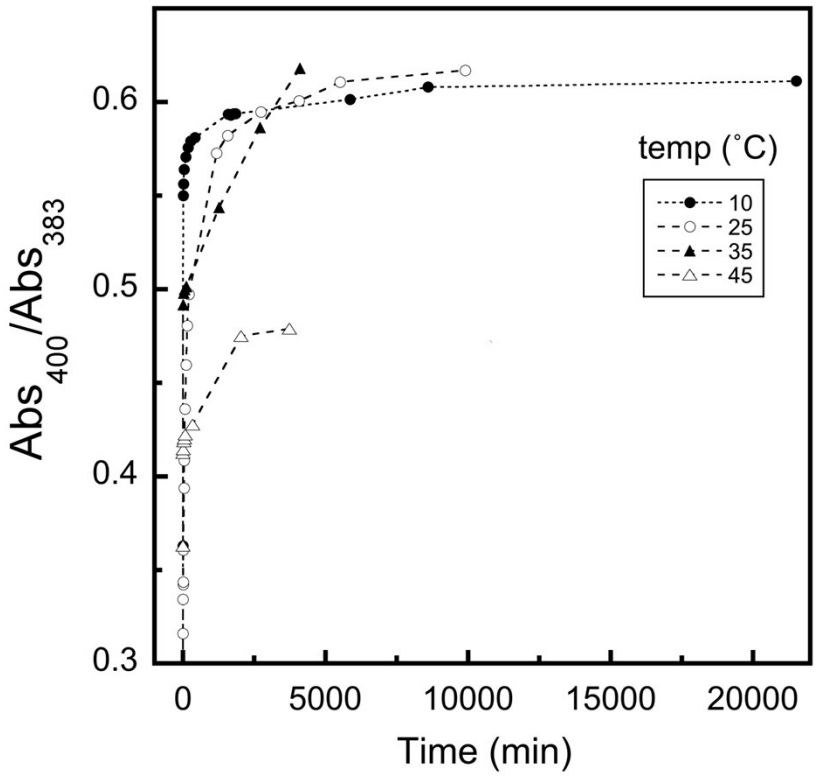

Figure S7. Time-dependent Absorption changes of ***g*-PA** (2 mM) in a *n*-hexane/THF (50 : 1) mixture at various temperatures.

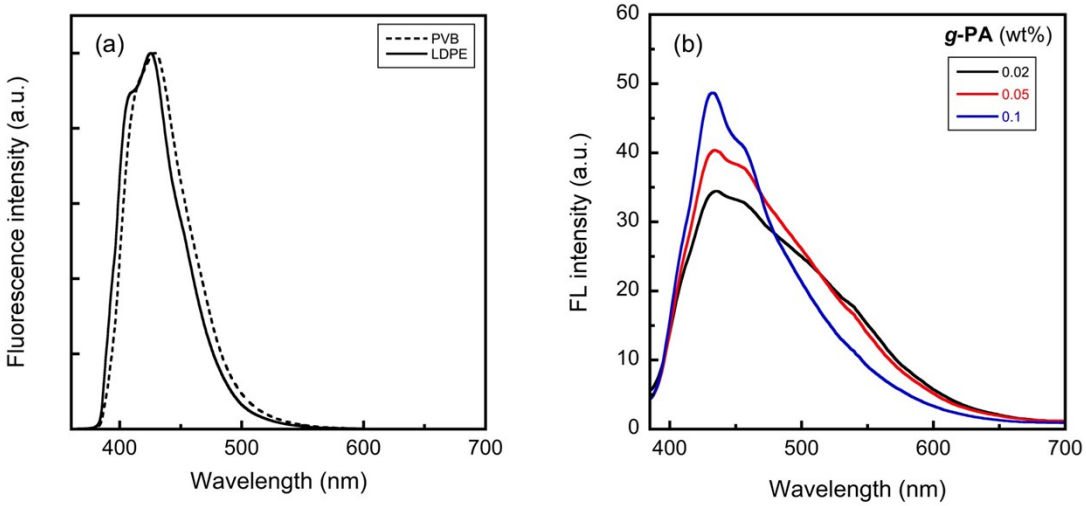

Figure S8. (a) Fluorescence spectra of 0.5 wt% phenyl anthracene incorporated into an LDPE film (solid line) and PVB film (dotted line). (b) Concentration dependent fluorescence spectral change of ***g*-PA** incorporated-LDPE film. The excitation wavelength was 380 nm.

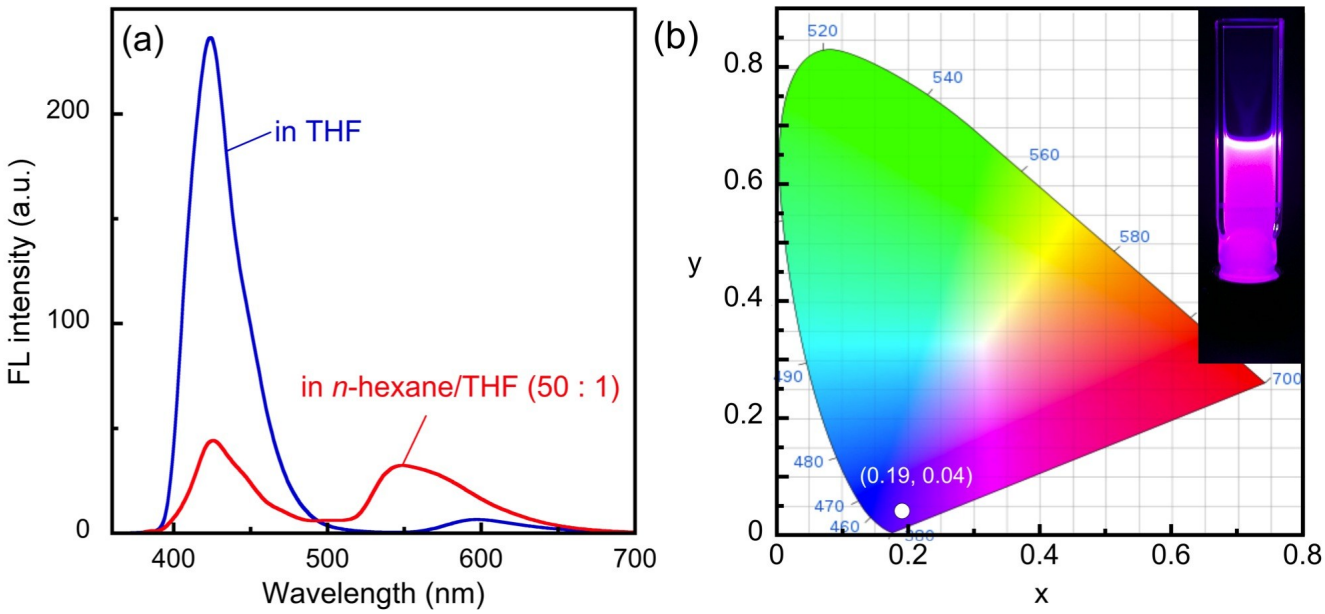

Figure S9. (a) Fluorescence spectra of ***g*-PA** (2 mM) with **NR** (0.03 mM) at 25 °C. The excitation wavelength is 385 nm. (b) CIE 1931 chromaticity coordinates of the ***g*-PA** (2 m M) with **NR** (0.03 mM) solution in THF at 25 °C. Inset photo is the ***g*-PA**/**NR** solution in THF under UV (365 nm) light.