A Simple and Sensitive Method for an Important Physical Parameter: Reliable Measurement of Glass Transition Temperature by AIEgens

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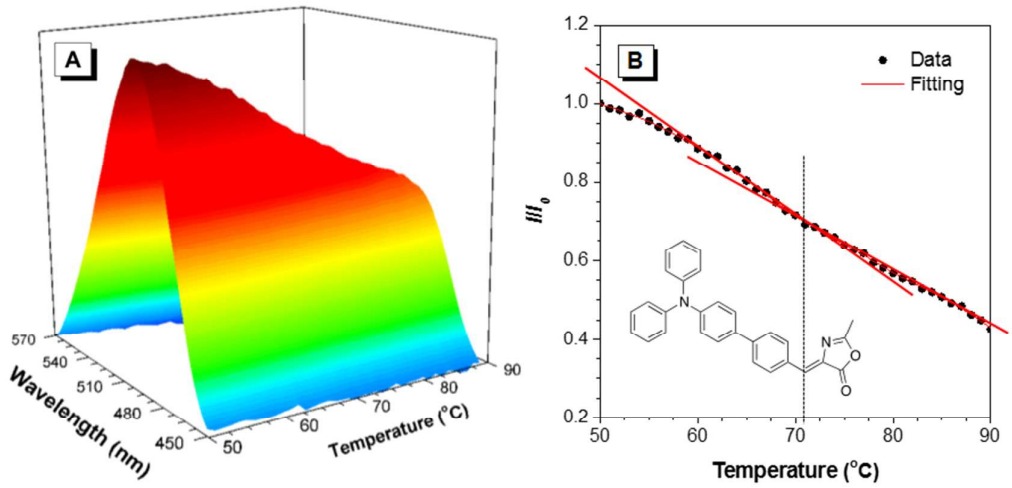

Figure S1. (A) PL spectra of TPA-BMO-doped PS-1 film at different temperatures. (B) Change of relative intensity (I/I_0) at 493 nm of TPA-BMO-doped PS-1 film with temperature and the associated linear fitting curves. I_0 = fluorescent intensity at 50 ^{o}C. Excitation: 365 nm. Inset: molecular structure of TPA-BMO.

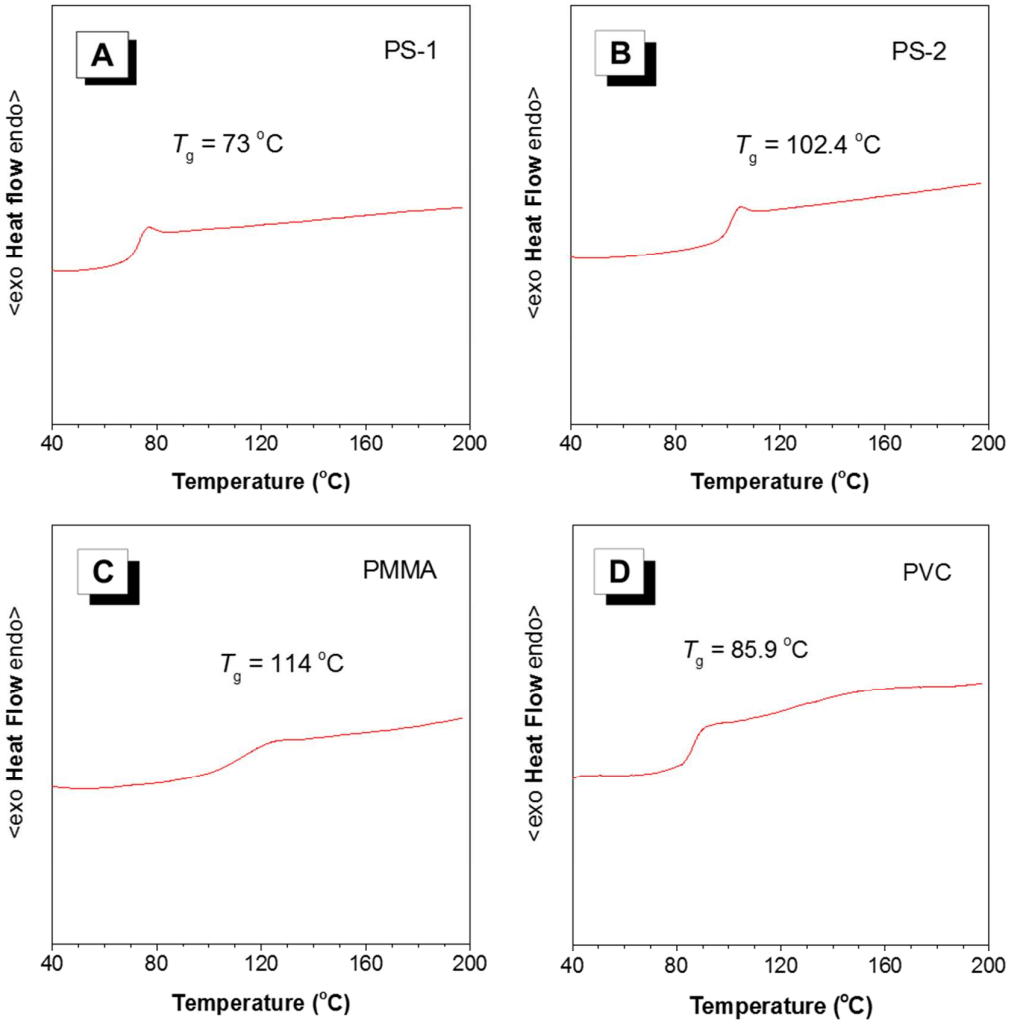

Figure S2. DSC thermograms of (A) PS-1, (B) PS-2, (C) PMMA and (D) PVC recorded during the second heating cycle under nitrogen at a heating rate of 10 °C/min.

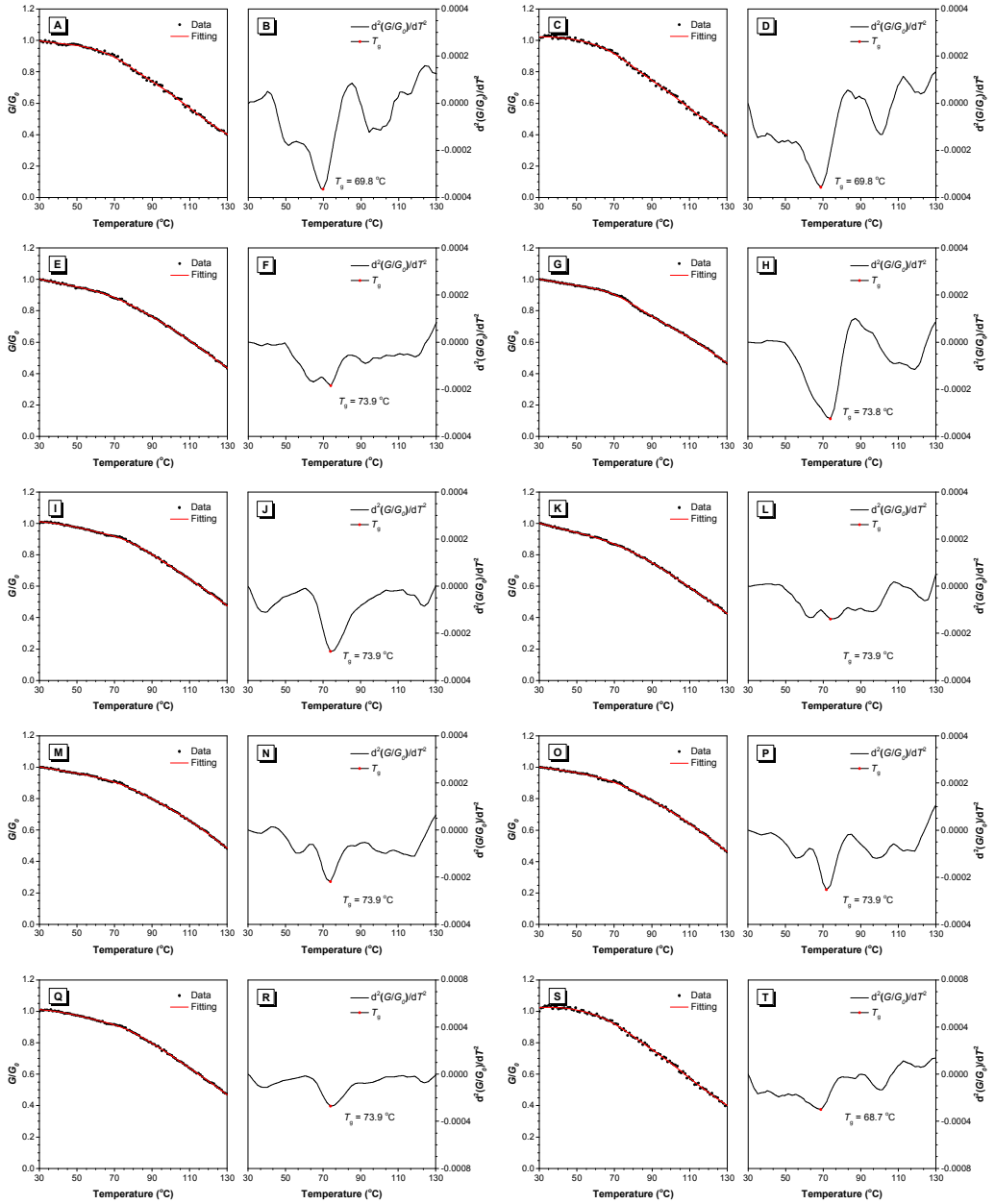

Figure S3. Reproducibility test for T_g detection of TPA-BMO-doped PS-1 film by ADEtect for 10 trials.

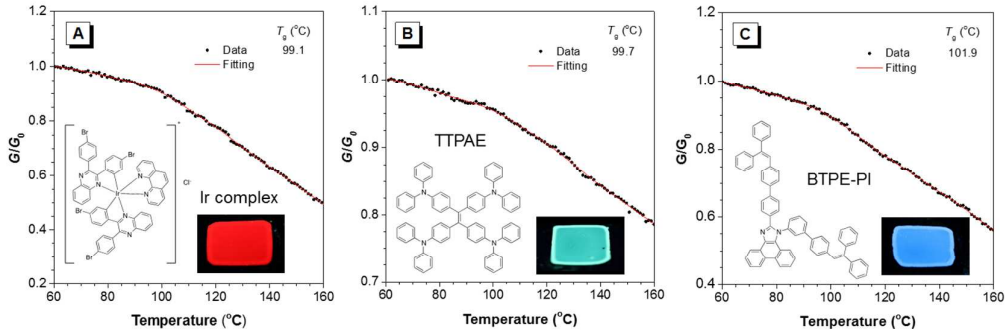

Figure S4. Change of relative grayscale (G/G_0) of (A) Ir complex, (B) TTPAE, and (C) BTPE-PI-doped PS-2 films with temperature. Heating rate: 6 °C/min. Inset: chemical structures of dye molecules studied in this work and fluorescent photos of dye-doped PS-2 films taken at room temperature under 365 nm UV irradiation.

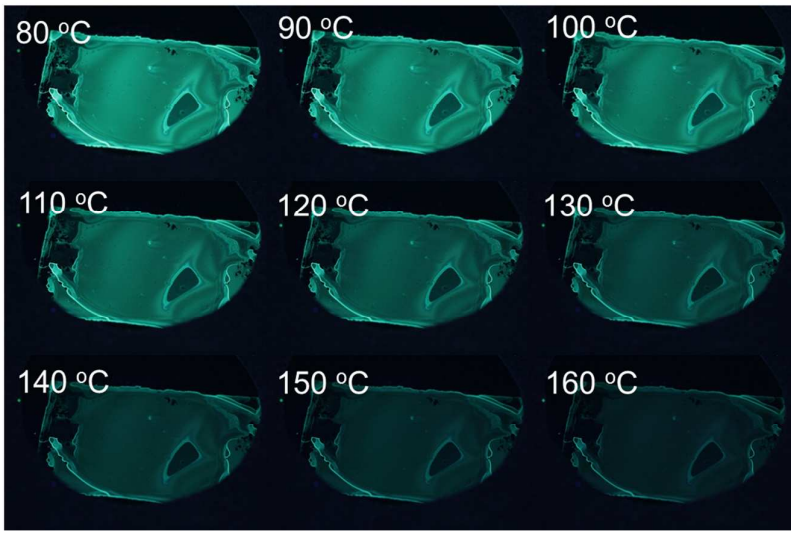

Figure S5. Photos of TPA-BMO-doped PS-2 films taken at different temperatures.

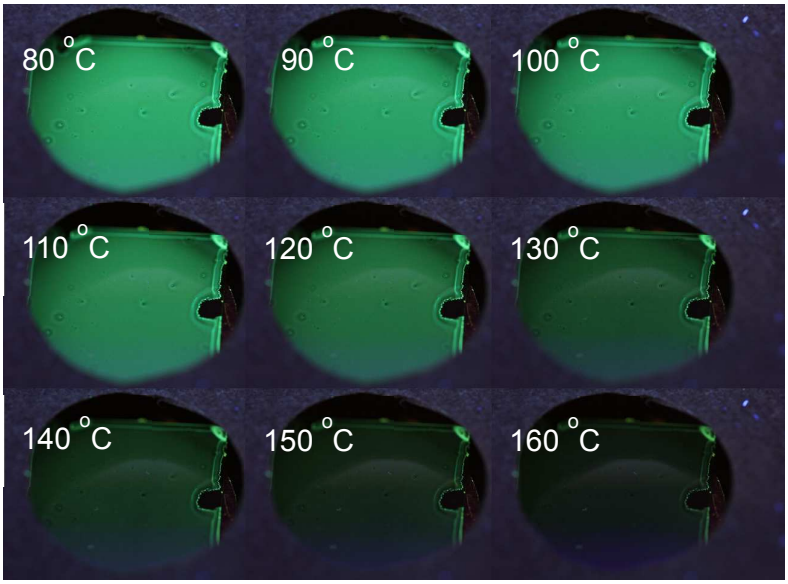

Figure S6. Photos of DPA-IQ-doped PS-2 films taken at different temperatures.

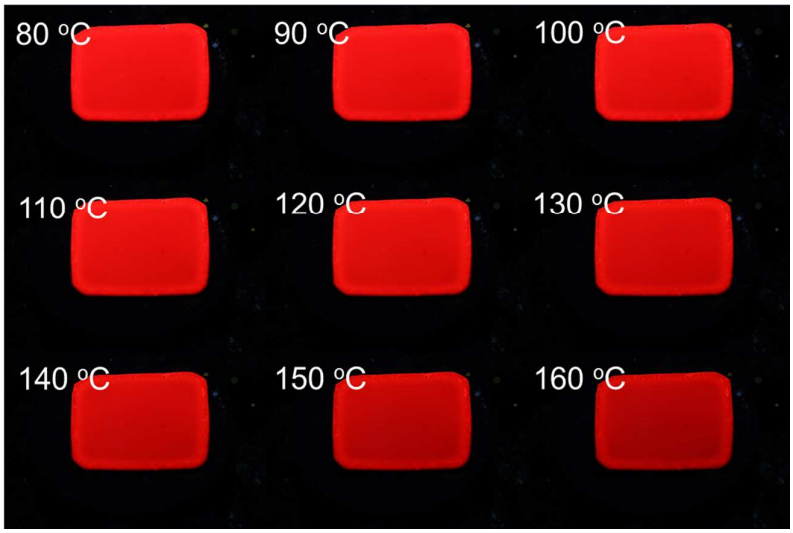

Figure S7. Photos of Ir complex-doped PS-2 films taken at different temperatures.

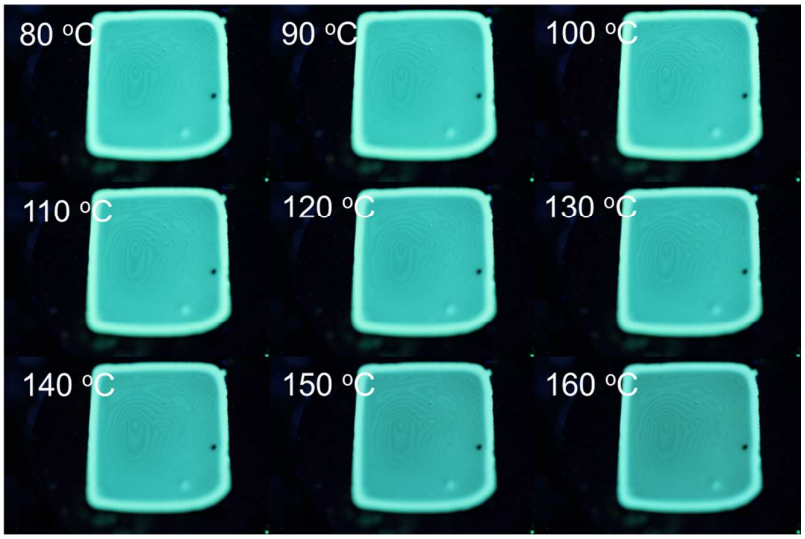

Figure S8. Photos of TTPAE-doped PS-2 films taken at different temperatures.

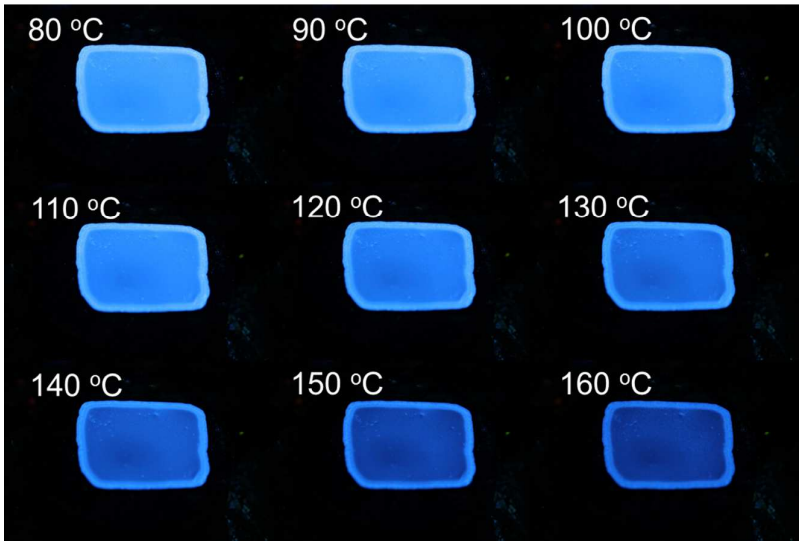

Figure S9. Photos of BTPE-PI-doped PS-2 films taken at different temperatures.

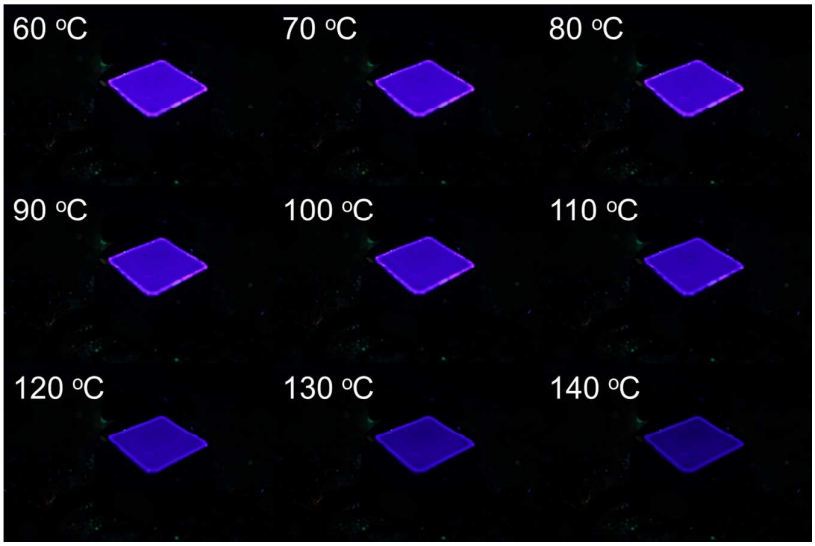

Figure S10. Photos of pyrene-doped PS-2 films taken at different temperatures.

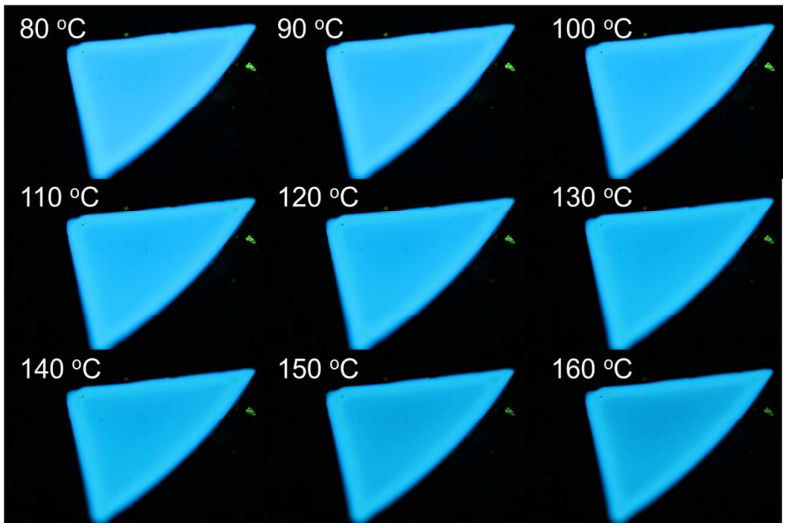

Figure S11. Photos of perylene-doped PS-2 films taken at different temperatures.

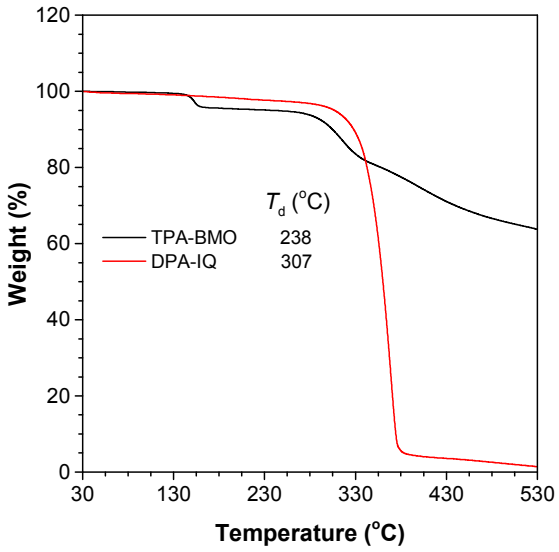

Figure S12. TGA thermograms of TPA-BMO and DPA-IQ recorded under nitrogen at a heating rate of 10 °C/min.

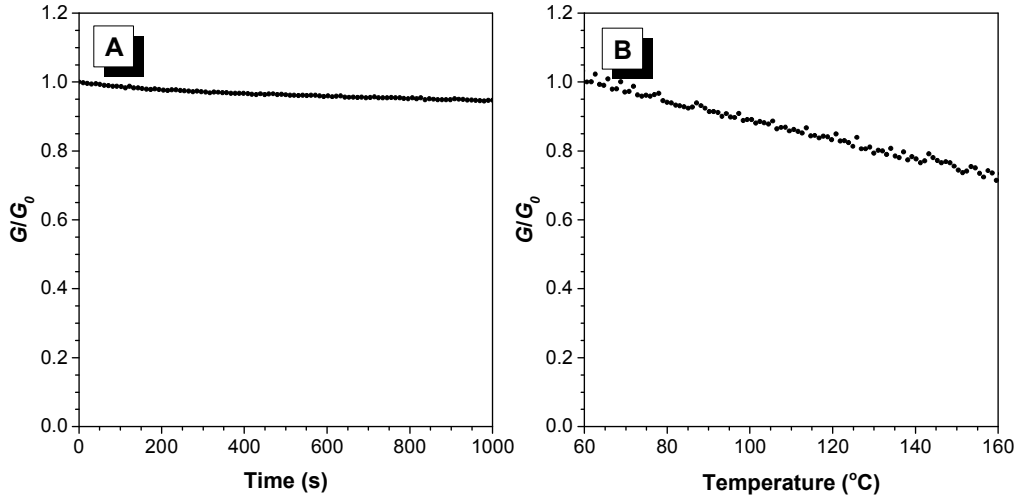

Figure S13. (A) Grayscale loss caused by photobleaching of DPA-IQ-doped PS-2 film at room temperature under continuous UV excitation from a handheld UV lamp. Excitation wavelength: 365 nm. G_0 = grayscale at time of 0 s. (B) Change of grayscale of DPA-IQ powders at different temperatures. Heating rate: 6 °C/min.

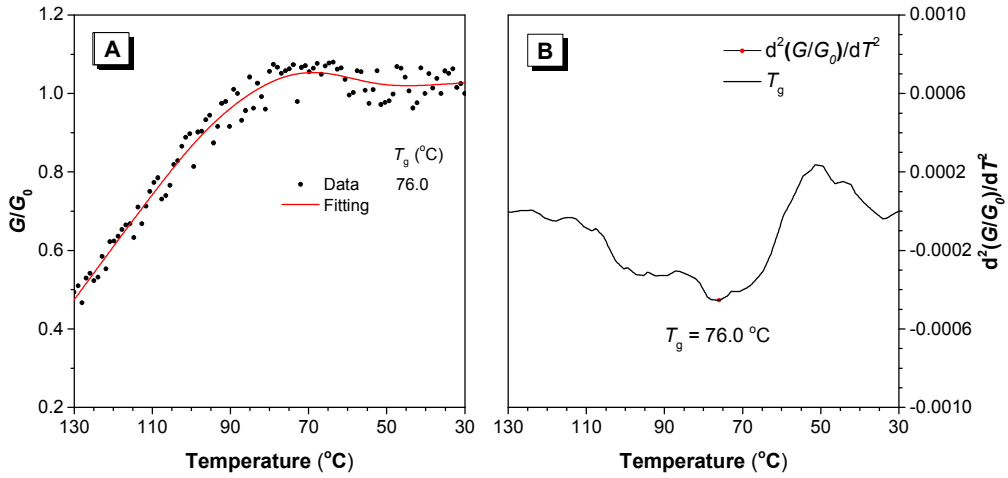

Figure S14. (A) Change of relative grayscale (G/G_0) of DPA-IQ-doped PS-1 film with temperature and the associated fitting curve. (B) The second derivative of the fitting curve revealed the change of G/G_0 at different temperatures. Cooling rate: 6 ^{o}C/min.

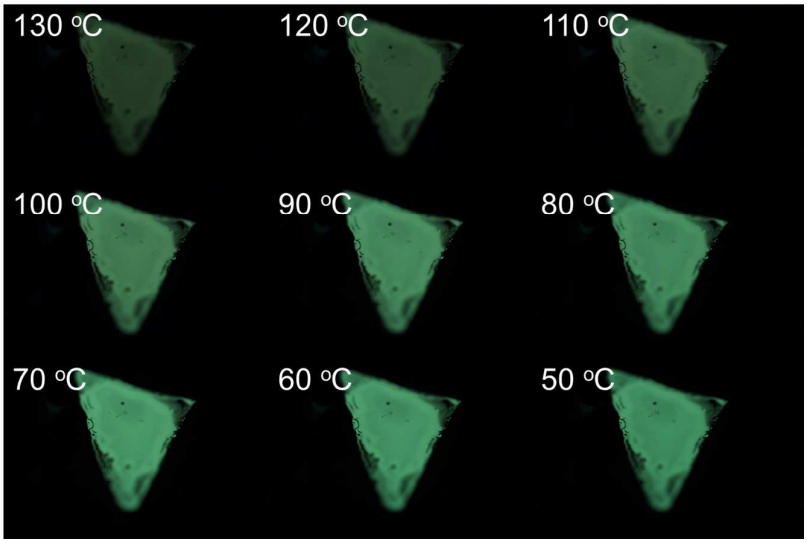

Figure S15. Photos of DPA-IQ-doped PS-1 films taken at different temperatures during the cooling cycle.

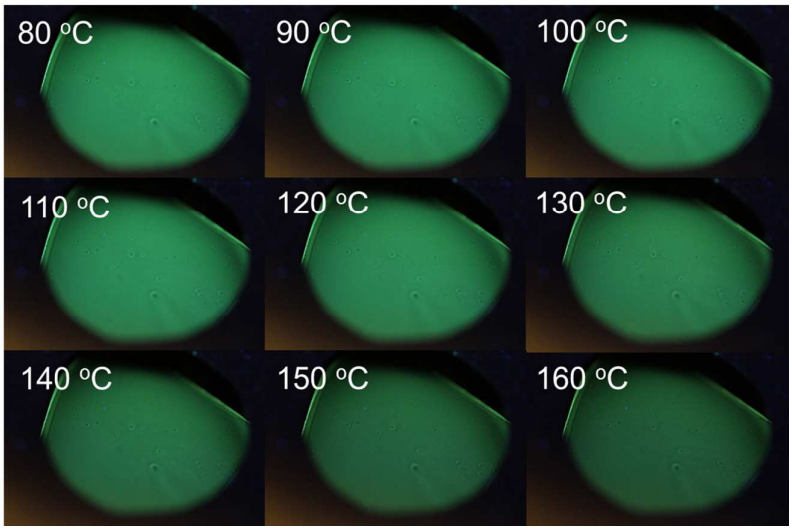

Figure S16. Photos of DPA-IQ-doped PMMA films taken at different temperatures.

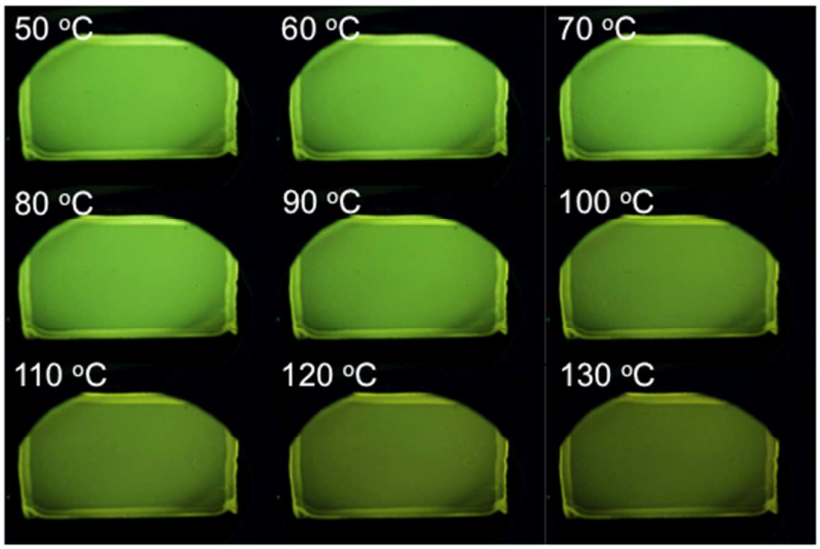

Figure S17. Photos of DPA-IQ-doped PVC films taken at different temperatures.

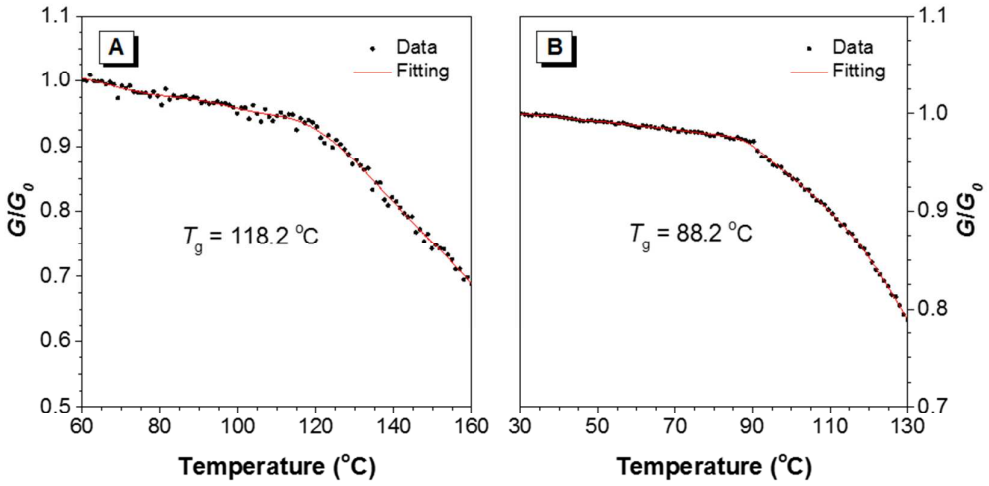

Figure S18. Change of relative grayscale (G/G_0) of DPA-IQ-doped (A) PMMA and (B) PVC films with temperature and the associated fitting curves. Heating rate: 6 °C/min.

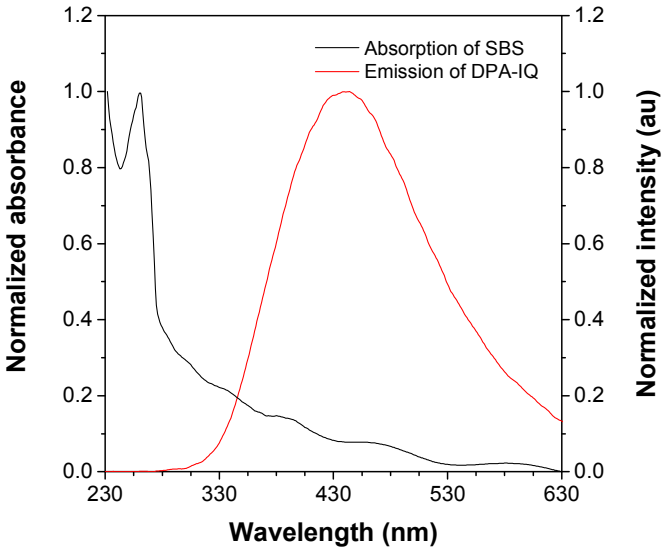

Figure S19. Normalized UV absorption spectra of SBS thin film and the solid-state emission spectrum of DPA-IQ.

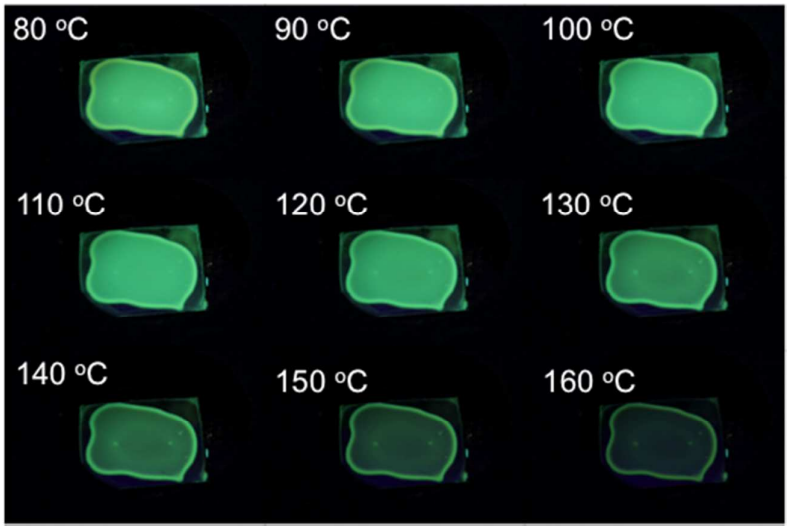

Figure S20. Photos of DPA-IQ-doped SBS films taken at different temperatures.

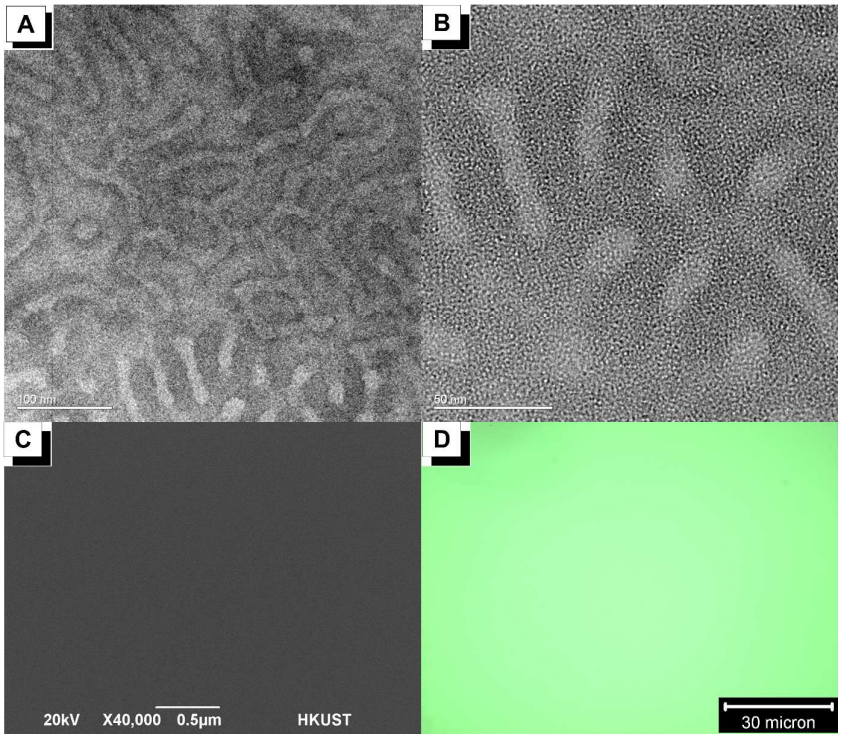

Figure S21. (A and B) TEM images of DPA-IQ-doped SBS film with OsO_4 staining to enhance the contrast between the PS and PBD components. Dark part: PBD; bright part: PS. (C) SEM image of DPA-IQ-doped SBS film. (D) Fluorescent microscopic image of DPA-IQ-doped SBS film.

Table S1. Comparison between ADEtect and DSC

Entry	Polymer	ADEtect (^{o}C)[a]	DSC (^{o}C)[b]
1	PS-1	72.5	72.5
2	PS-2	100.3	102.4
3[c]	PMMA	118.2	120.0
4	PMMA	118.2	121.3
5[d]	PMMA	120.2	124.3
6	PVC	88.2	85.9
7[e]	SBS	93.6	100.5

[a]Doped with 1.0 wt% of DPA-IQ and heated at a heating rate of 6 ^{o}C/min. [b]Heated under nitrogen at a heating rate of 6 ^{o}C/min during the second heating cycle. [c]Measured at a heating rate of 3 ^{o}C/min. [d]Measured at a heating rate of 12 ^{o}C/min. [e]ADEtect data was measured at a heating rate of 6 ^{o}C/min, while the DSC data was measured at a heating rate of 30 ^{o}C/min.

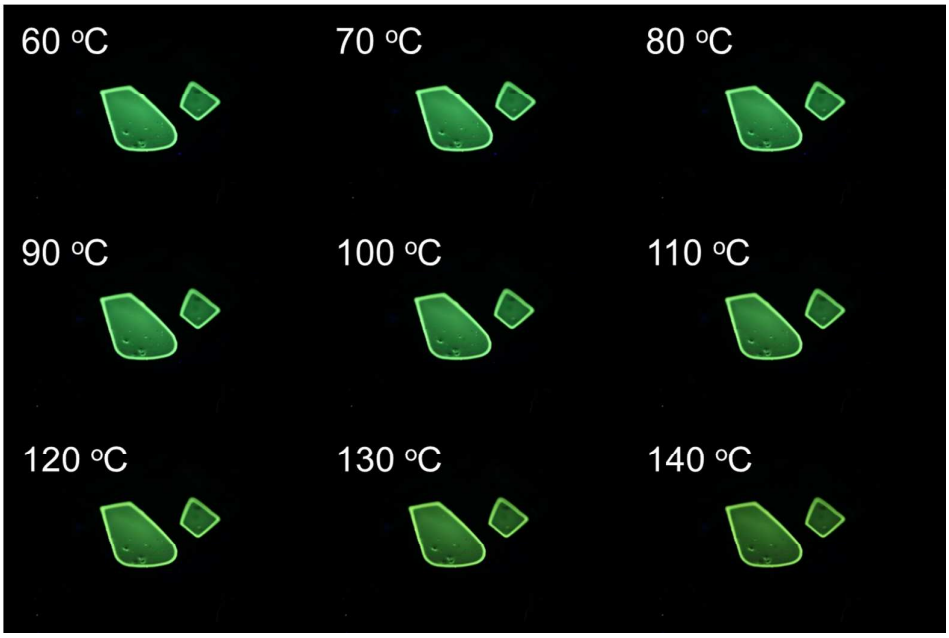

Figure S22. Photos of two DPA-IQ-doped PMMA films taken at different temperatures.