nanomaterials

# Supplementary Materials

# Polycarbonate/Titania Hybrid Films with Localized Photo-Induced Magnetic-Phase Transition

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## Supporting Figures

**Figure S1.** $^1$H-NMR spectrum of ET-PHMCD.

**Figure S2.** $^1$H-NMR spectrum of ET-coPCD 31.

**Figure S3.** $^1$H-NMR spectrum of ET-coPCD 11.

**Figure S4.** $^1$H-NMR spectrum of ET-coPCD 13.

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**Figure S6.** UV-Vis spectra of different hybrid films 10 days after UV irradiation: PC100 (black),PC75 (red), PC50 (orange), PC25 (green), and PC0 (purple).

**Figure S7.** Transmittance of different hybrid films at 400 nm: before UV irradiation, immediately after 2 h of UV irradiation, and 10 days after irradiation. PC100 (black), PC75 (red), PC50 (orange), PC25 (green), and PC0 (purple).

**Figure S8.** FT-IR spectral profiles of hybrid films: before UV irradiation (red line), UV irradiation after 12 h (orange line), (**a**) PC100, (**b**) PC75, (**c**) PC50, (**d**) PC25, and (**e**) PC0.

**Figure S9.** ESR spectral profiles of hybrid films after UV irradiation: (**a**) PC100, (**b**) PC75, (**c**) PC50, (**d**) PC25, and (**e**) PC0.

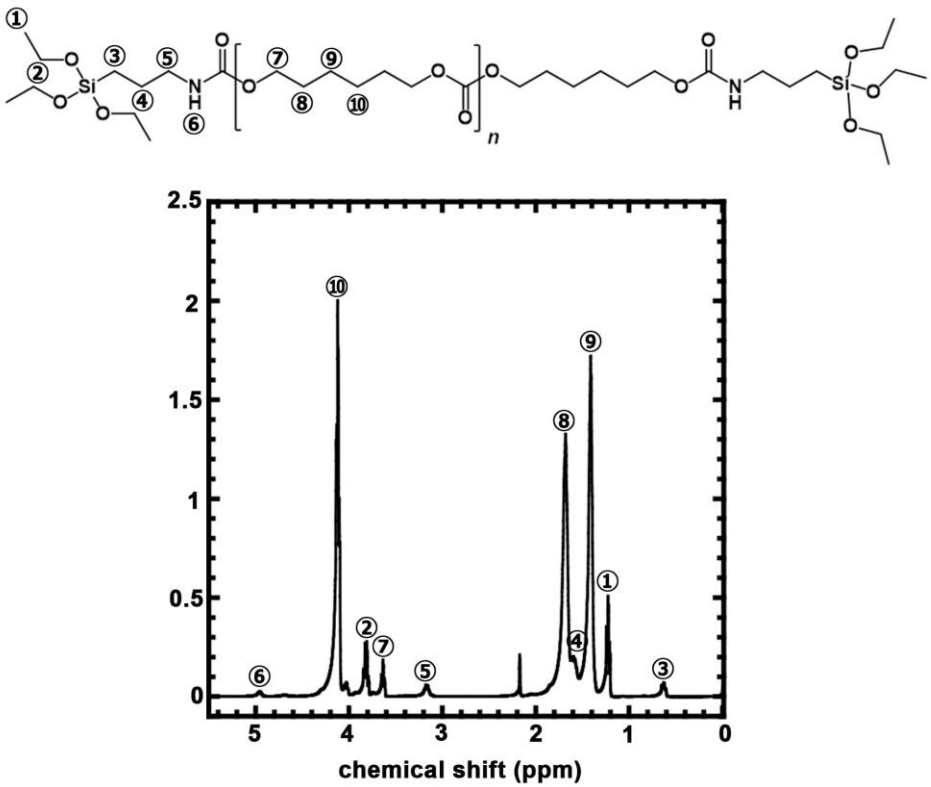


**Figure S1.** $^{1}$H-NMR spectrum of ET-PHMCD.

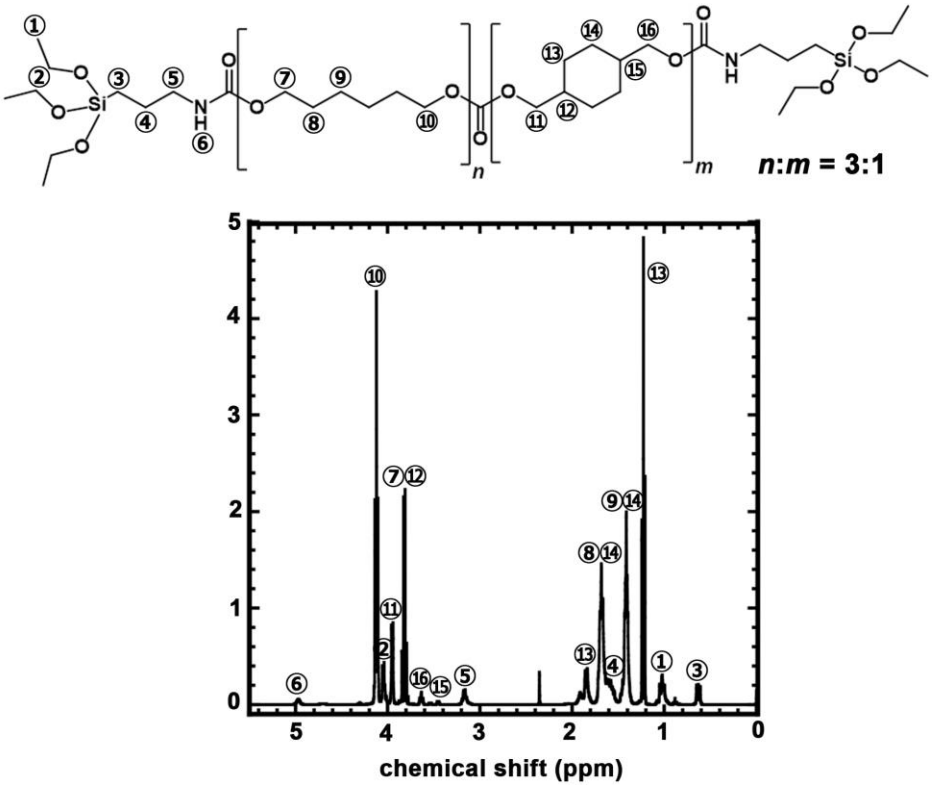


**Figure S2.** $^{1}$H-NMR spectrum of ET-coPCD 31.

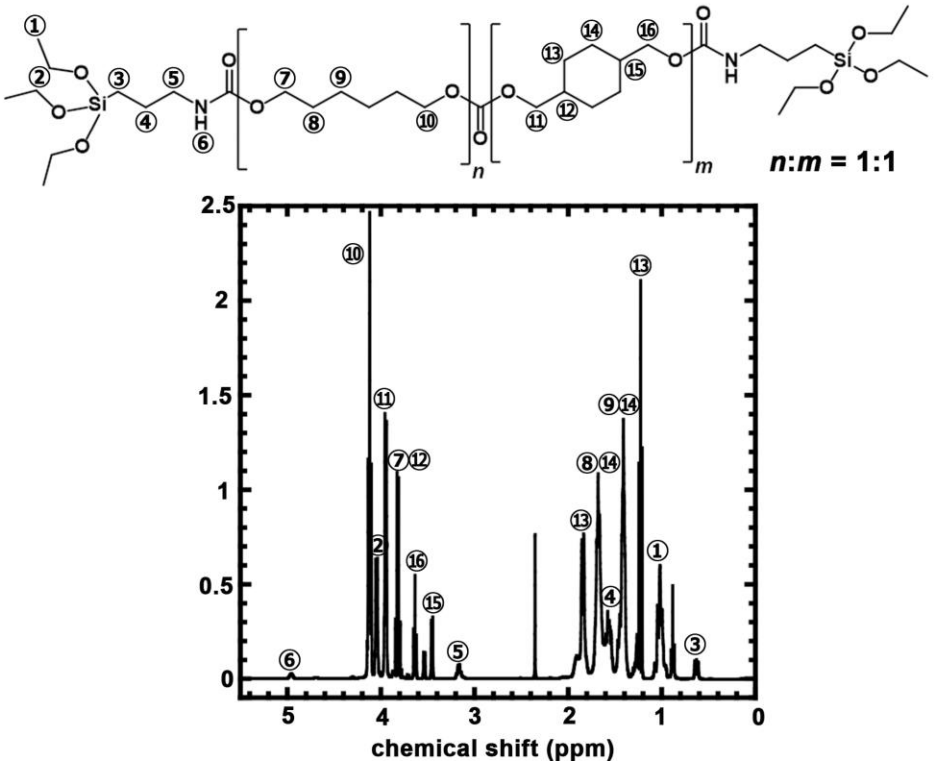


**Figure S3.** $^{1}$H-NMR spectrum of ET-coPCD 11.

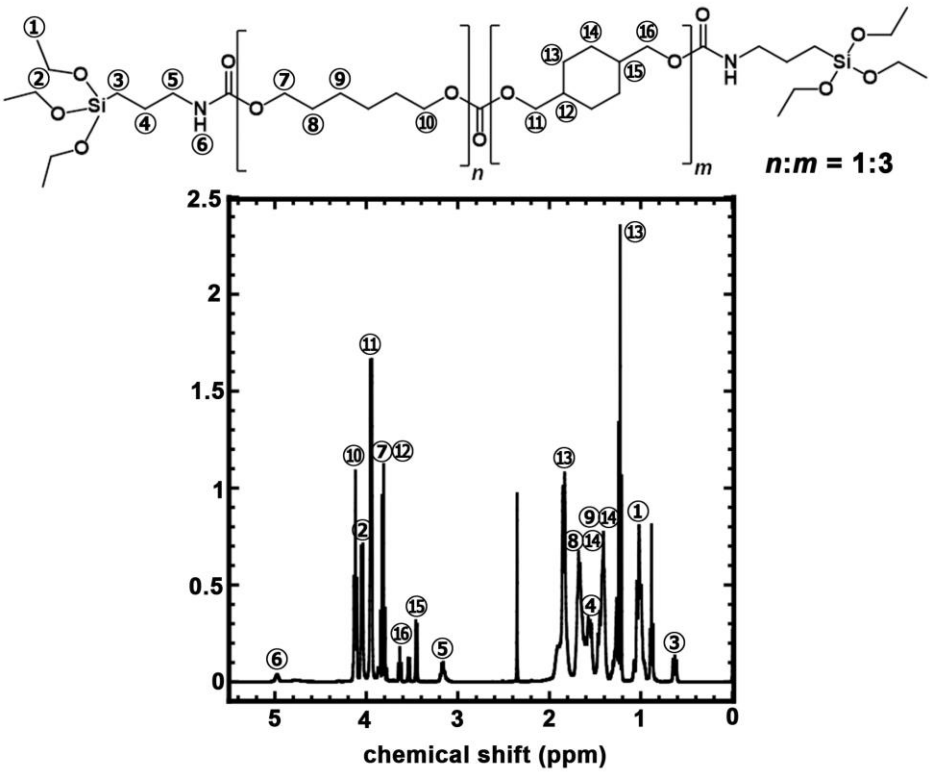


**Figure S4.** $^{1}$H-NMR spectrum of ET-coPCD 13.

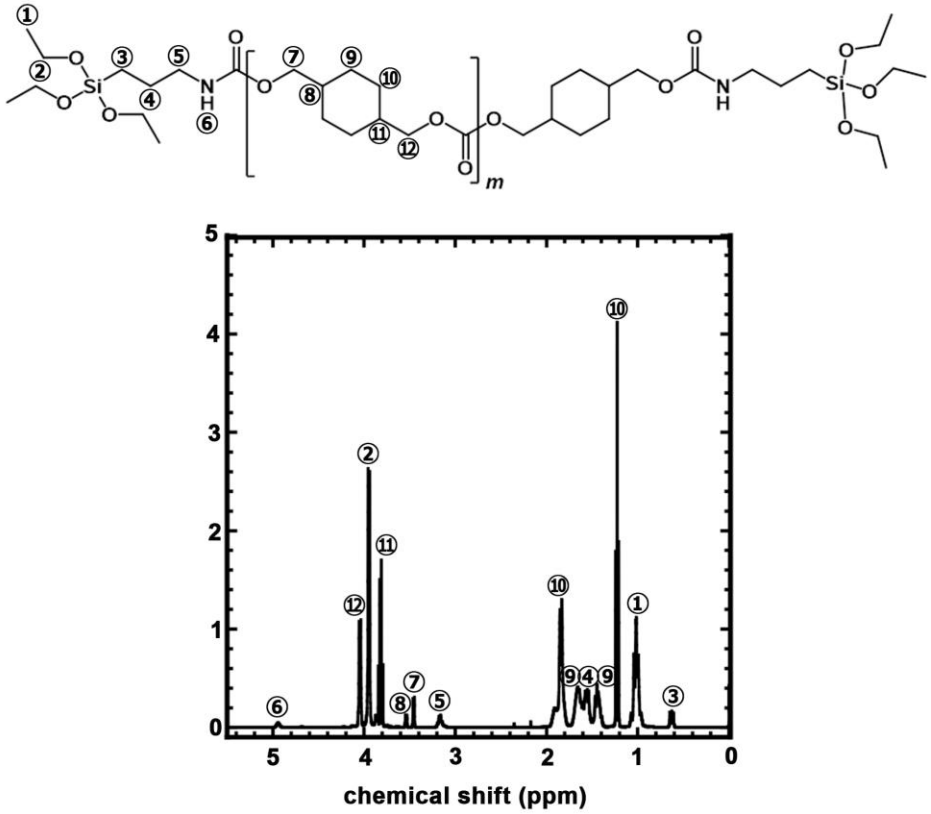


**Figure S5.** $^{1}$H-NMR spectrum of ET-PCHCD.

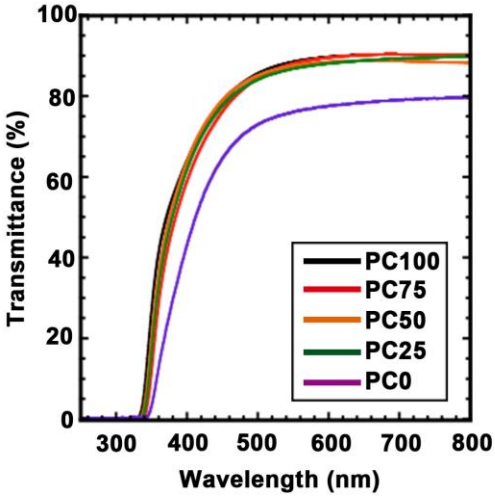


**Figure S6.** UV-Vis spectra of different hybrid films 10 days after UV irradiation: PC100 (black), PC75 (red), PC50 (orange), PC25 (green), and PC0 (purple).

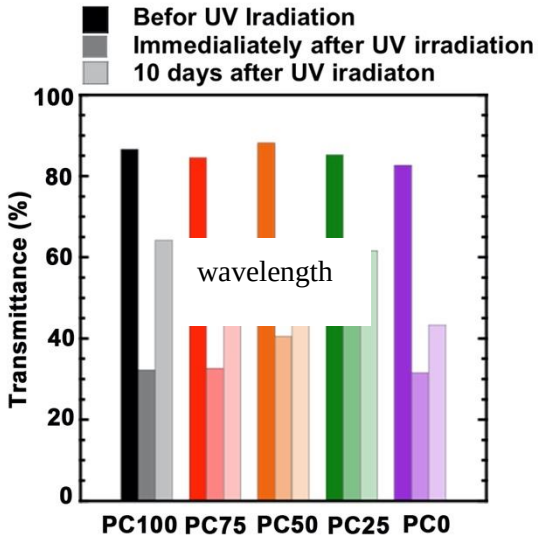


**Figure S7.** Transmittance of different hybrid films at 400 nm: before UV irradiation, immediately after 2 h of UV irradiation, and 10 days after irradiation. PC100 (black), PC75 (red), PC50 (orange), PC25 (green), and PC0 (purple).

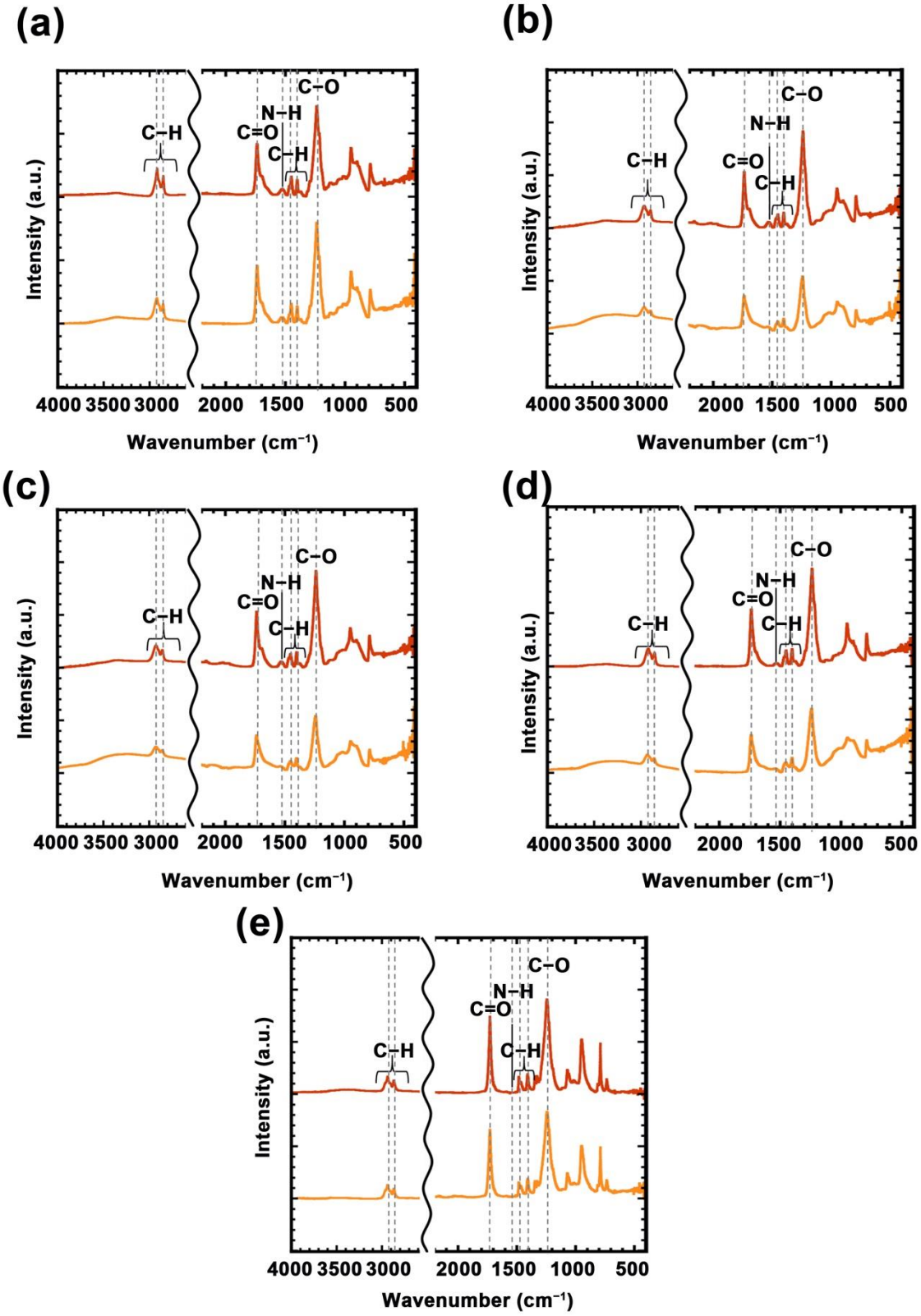


**Figure S8.** FT-IR spectral profiles of hybrid films: before UV irradiation (red line), UV irradiation after 12 h (orange line), (**a**) PC100, (**b**) PC75, (**c**) PC50, (**d**) PC25, and (**e**) PC0.

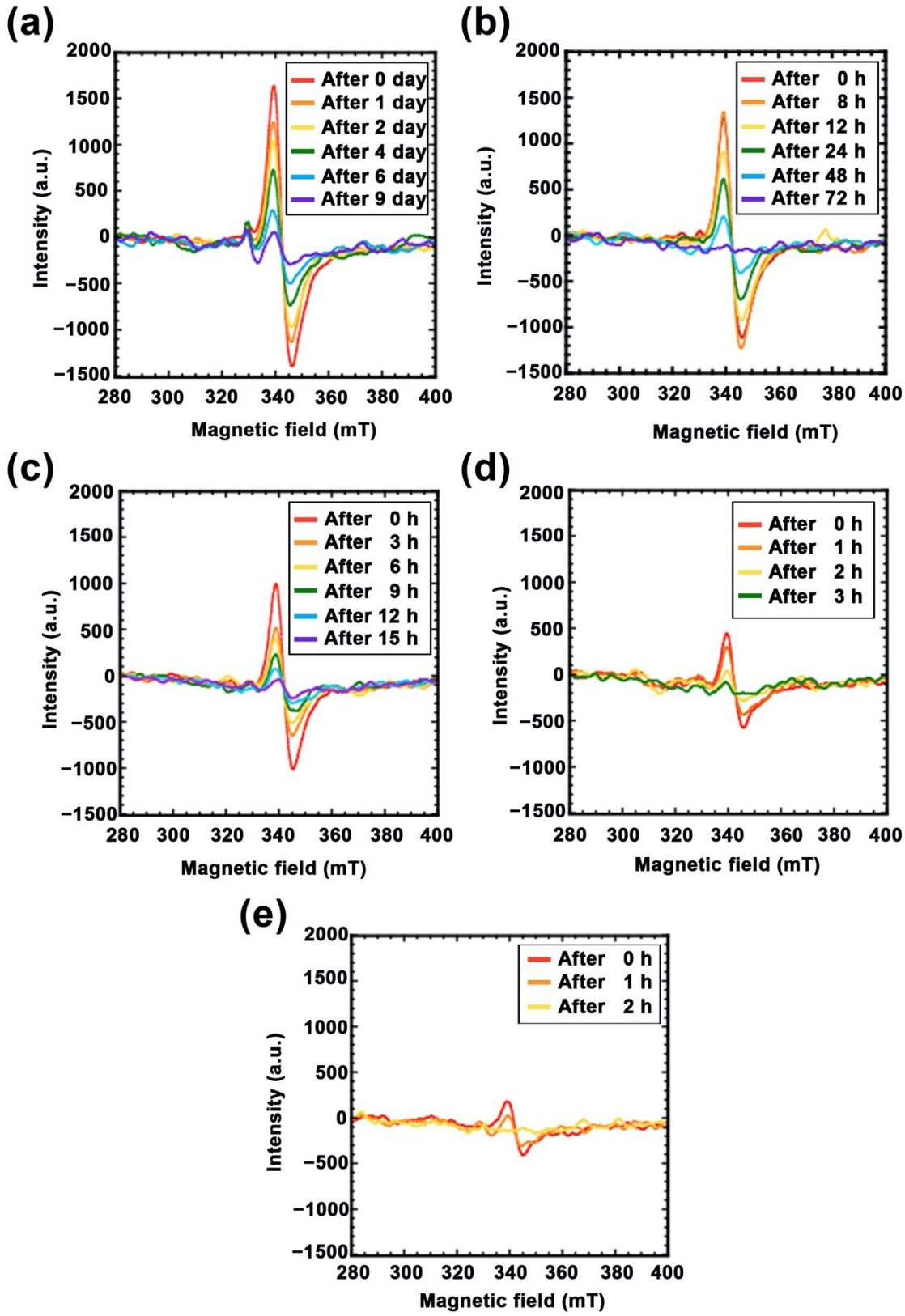


**Figure S9.** ESR spectral profiles of hybrid films after UV irradiation: (**a**) PC100, (**b**) PC75, (**c**) PC50, (**d**) PC25, and (**e**) PC0.

**Table S1.** Summary of results from the tensile test and DMA measurement.

| Sample | Tensil strength | Young modulus | fracture energy | Storage E′at 25 °C | Tg (DMA) |
|---|---|---|---|---|---|
| | (MPa) | （GPa） | (MJ/m3) | E' (Pa) | (°C) |
| PC100 | 23.69 | 3.81 | 190.4 | $2.36*10^9$ | 68.5 |
| PC75 | 9.07 | 0.97 | 139.6 | $1.54*10^9$ | 40.6 |
| PC50 | 10.92 | 0.26 | 227.8 | $3.45*10^7$ | 12.8 |
| PC25 | 3.45 | 0.10 | 54.4 | $1.94*10^7$ | 1.9 |
| PC0 | - | - | - | $1.91*10^7$ | -28.8 |