Supporting Information

Photohardenable Pressure-Sensitive Adhesives using Poly(methyl methacrylate) containing Liquid Crystal Plasticizers

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Measurement of tack strength of PP_x/PMMA mixtures.

Tack strength was measured by a probe tack test. Probe tack test was conducted in the rheometer using an aluminum probe under the following conditions: temperature was 25 °C, the approaching and debonding speeds were 0.5 mm/s, the contact pressure was 1 ± 0.2 N/cm^2, and the contact time was 1 s. To investigate the tackiness of photoplasticized samples, the tack strength of the samples pre-irradiated with UV light (wavelength: 365 nm; intensity: 30 mW/cm^2) for 30 min were measured under UV-light irradiation.

Supplementary figures

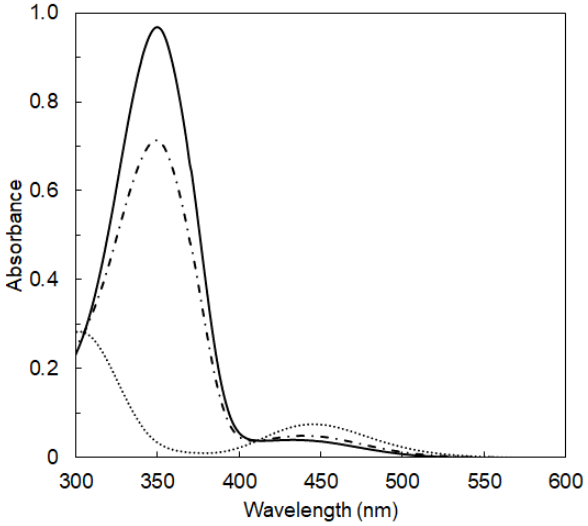

Figure S1. UV−vis absorption spectral changes of BMAB in THF before UV-light irradiation (solid line) and after UV-light (dotted line; wavelength: 365 nm; intensity: 30 mW/cm^2) irradiation, and after Vis-light (dot-dashed line; wavelength: 435 nm; intensity: 30 mW/cm^2) irradiation following the UV-light irradiation.

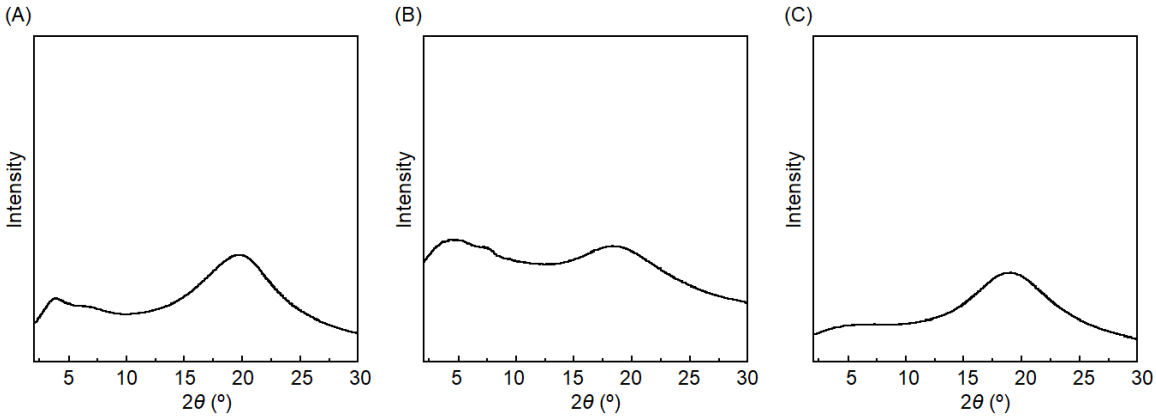

Figure S2. The XRD patterns of (A) PP_5, (B) PP_{50}, and (C) PP_{100} after UV-light irradiation at 25 ^oC.

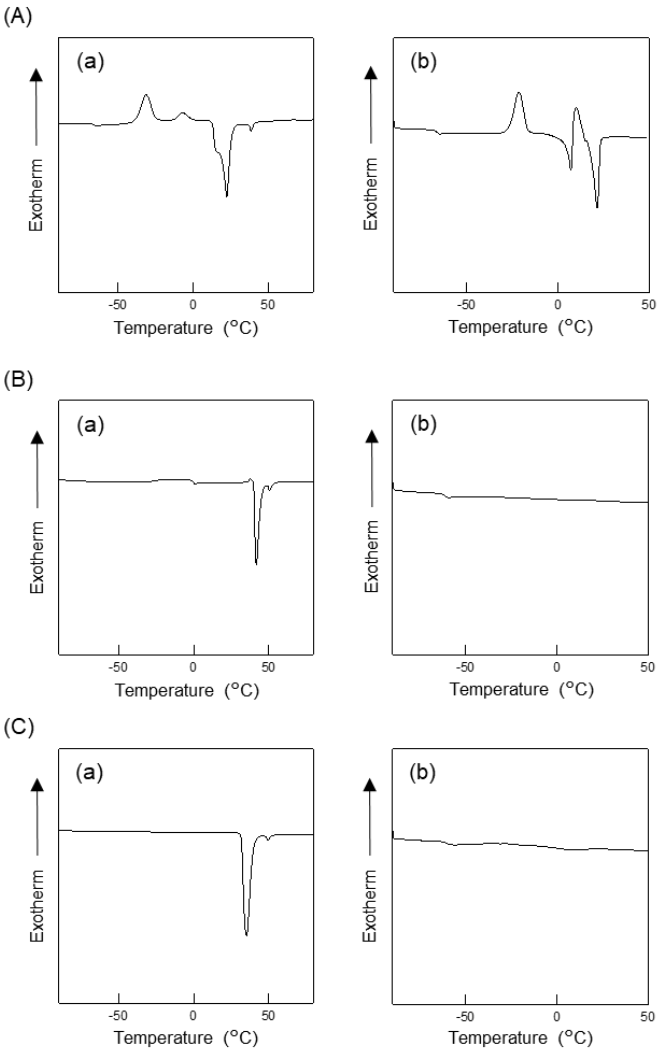

Figure S3. The DSC curves of (A) PP_5, (B) PP_{50}, and (C) PP_{100} before (a) and during (b) UV-light irradiation.

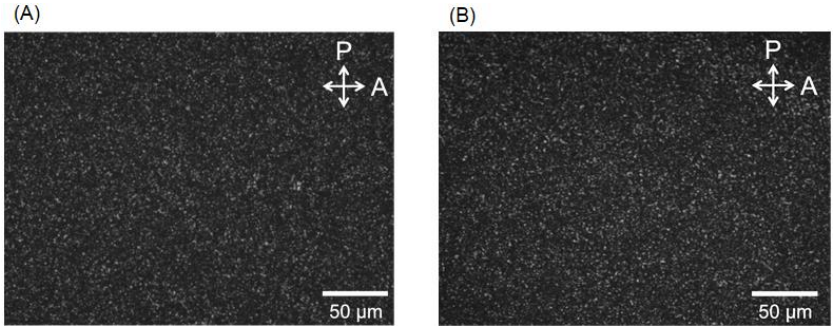

Figure S4. Polarized optical micrographs of (A) PP_{50}/PMMA and (B) PP_{100}/PMMA before UV-light irradiation at 25 ºC. P and A denote polarizer and analyzer, respectively.

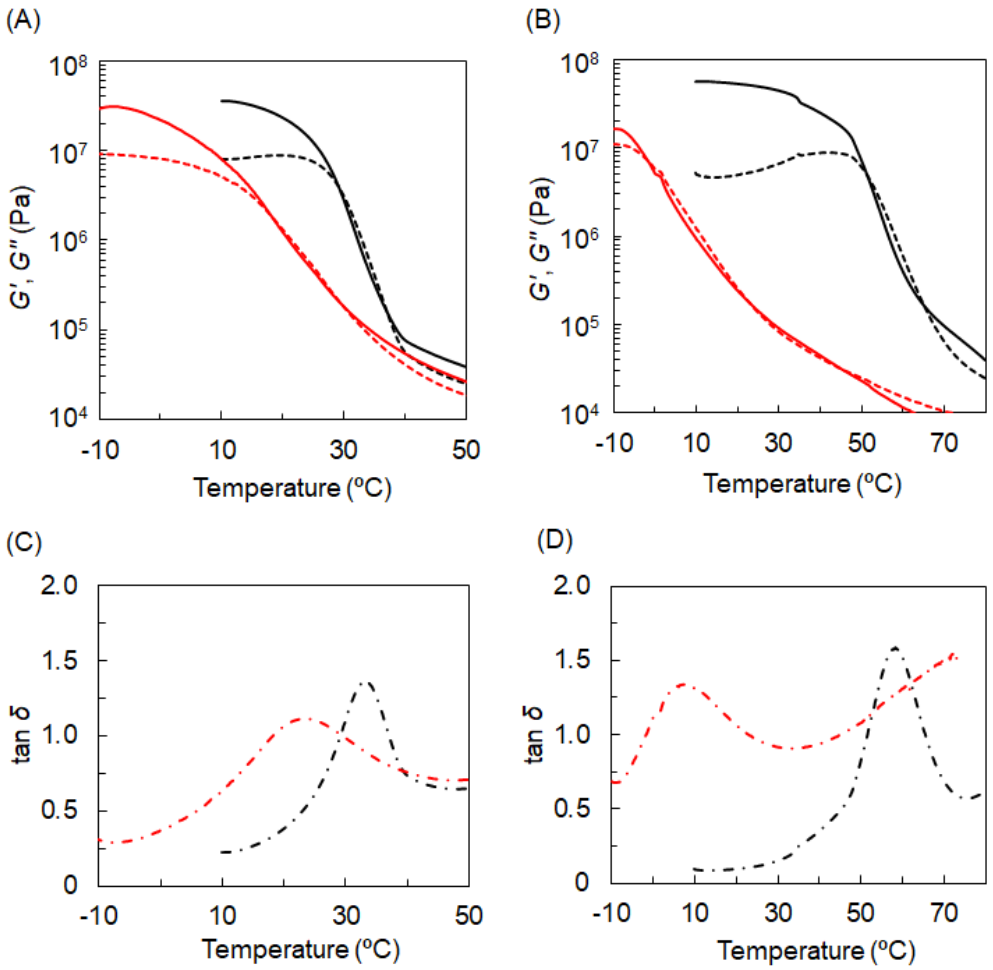

Figure S5. Temperature dependences of the viscoelastic parameters of PP_x/PMMA mixtures before (black lines) and under (red lines) UV-light irradiation (wavelength: 365 nm; intensity: 30 mW/cm^2). (A) and (B) show the G' (solid lines) and G'' (dashed lines) values of PP_5/PMMA and PP_{100}/PMMA, respectively. (C) and (D) show the tanδ values of PP_5/PMMA and PP_{100}/PMMA, respectively. The viscoelastic parameters were measured at a frequency of 1 Hz and a strain of 0.1% upon heating at 1 °C/min.

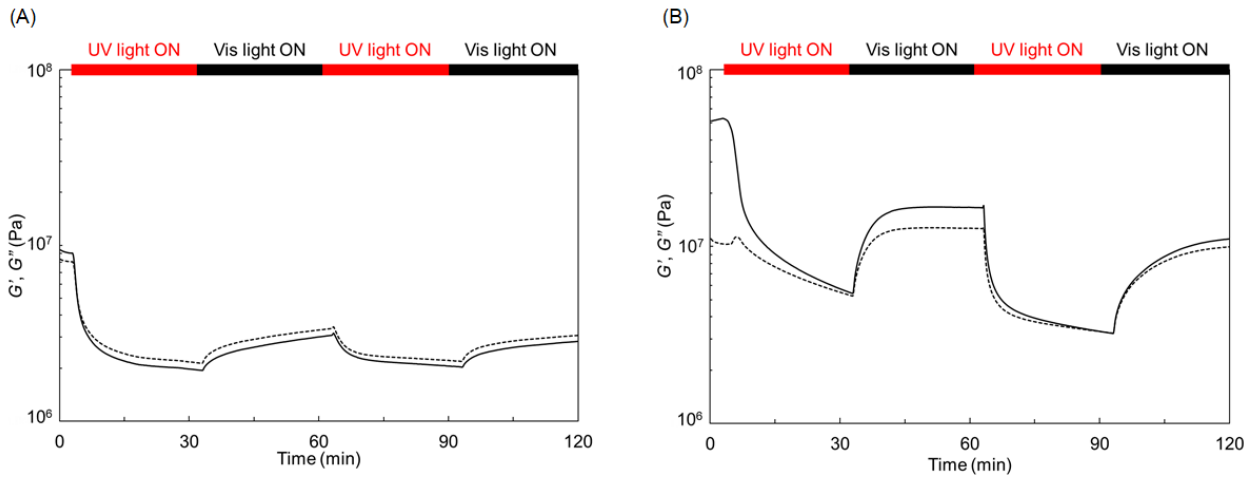

Figure S6. The viscoelastic parameters of (A) PP_5/PMMA and (B) PP_{100}/PMMA at 25 ºC upon the alternate irradiation of UV (wavelength: 365 nm; intensity: 30 mW/cm^2) and Vis (wavelength: 435 nm; intensity: 30 mW/cm^2) light; solid line: *G'*; dashed line: *G''*.

Table S1. Tack strengths of PP_5/PMMA, PP_{50}/PMMA, and PP_{100}/PMMA at 25 ºC under UV-light irradiation (wavelength: 365 nm; intensity: 30 mW/cm^2).

Sample	Tack strength under UV-light irradiation (mN/mm^2)
PP_5/PMMA	7.3 ± 1.3
PP_{50}/PMMA	3.0 ± 0.4
PP_{100}/PMMA	5.6 ± 1.4

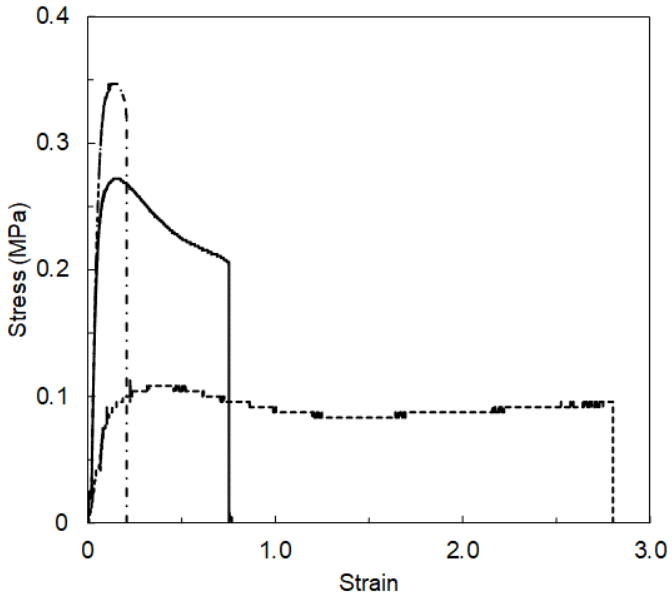

Figure S7. The stress-strain curves of PP_5/PMMA (dotted line), PP_{50}/PMMA (solid line), and PP_{100}/PMMA (dot-dashed line) at 25 ºC.

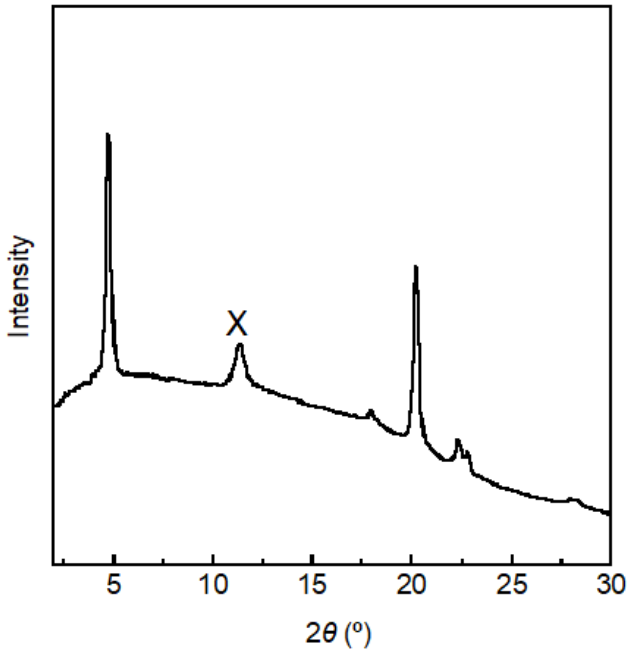

Figure S8. The XRD pattern of the PP_{50}/PMMA film at 25 ºC with polyimide sheets. The peak labeled as "X" originates from the polyimide sheet.

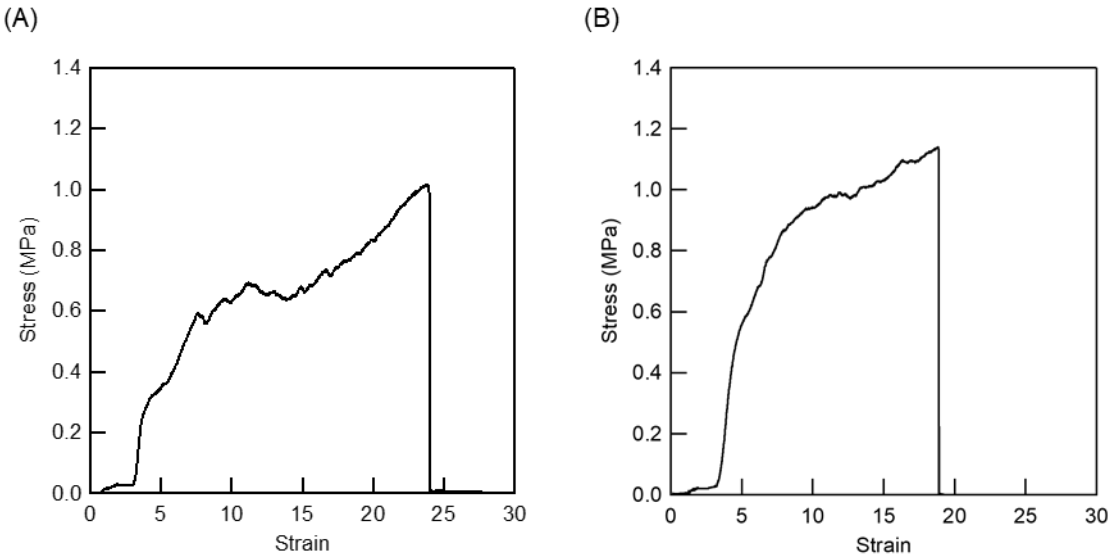

Figure S9. Typical stress-strain curves obtained in a lap-shear test of PP_{50}/PMMA sample specimens prepared in (A) photochemical and (B) thermal manners.