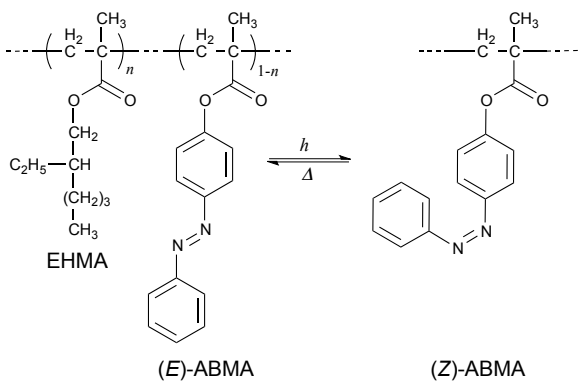


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Scheme S1 Chemical structure of P(EHMA-ABMA) and photo-induced *E/Z* isomerization of the ABMA moiety.

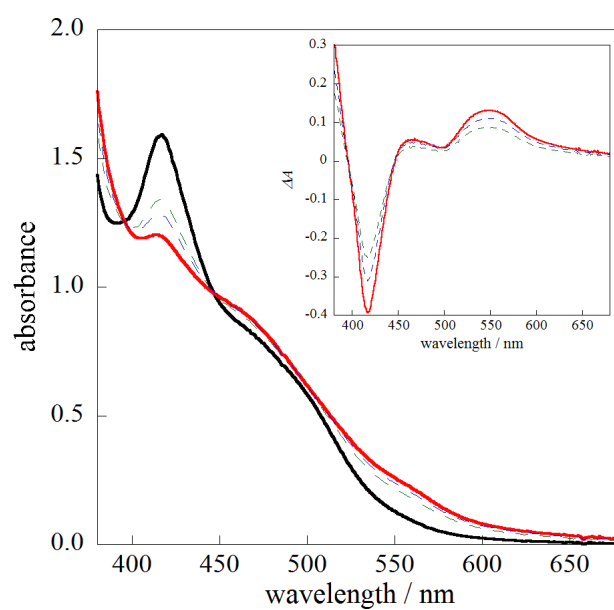


Fig. S1 Change of absorption spectra of toluene solution containing P(EHMA-APMA) and CoS on exposure to oxygen. concentration : [APMA moiety] = 0.05 mM, [CoS] = 0.08 mM; partial pressure of oxygen: 0 (black solid), 175 (green dotted), 380 (blue dotted), 760 Torr (red solid).

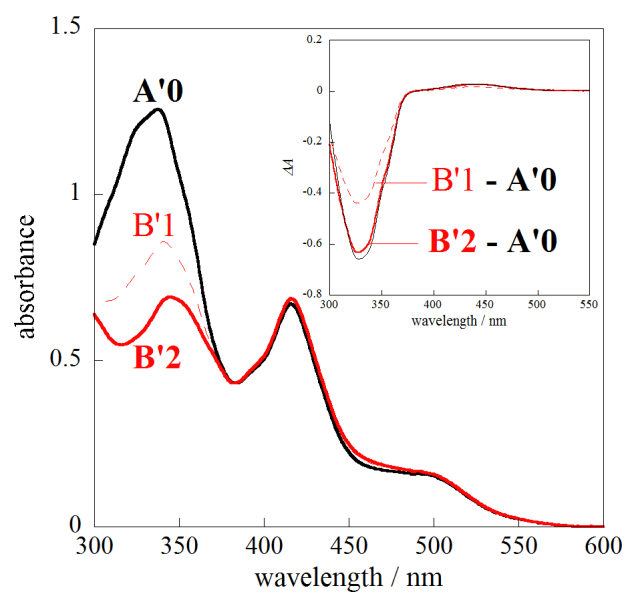


Fig. S2 Absorption spectra of toluene solution containing P(EHMA-ABMA) and CoS in the dark (black), at photo-stationary state (red solid) by irradiating with the 320-nm light (1.0 mW cm^{-2}), and in the process to reach the photo-stationary state (red dotted) under nitrogen atmosphere. inset: differential spectra between the spectra before (A'0) and after the 320-nm light irradiation (B'1 and B'2). The differential spectrum in black is for another solution containing P(EHMA-ABMA) only.

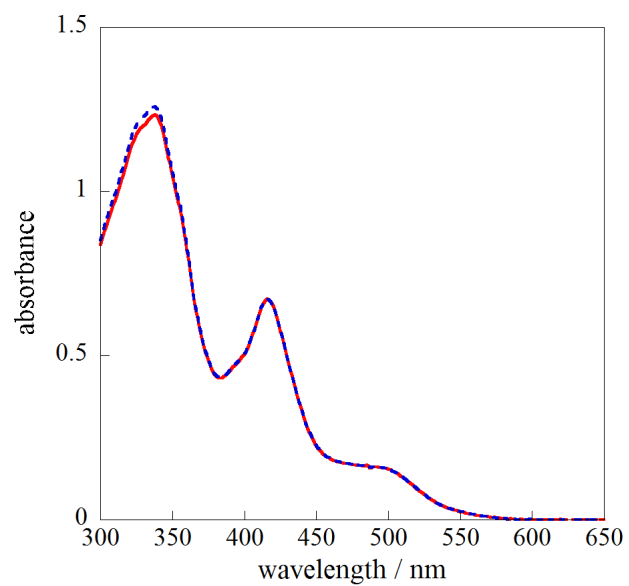


Fig. S3 No change of absorption spectra of toluene solution containing P(EHMA-ABMA) and CoS under nitrogen atmosphere (red) and on exposure to oxygen (blue dotted, $p_{O_2} = 760$ Torr).

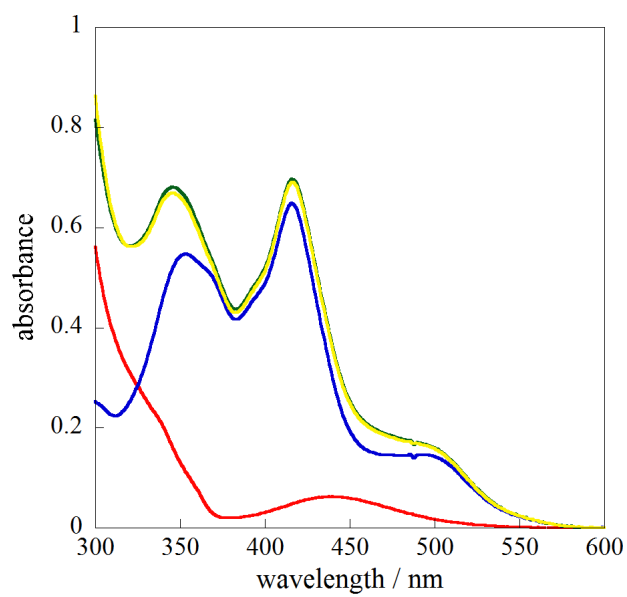


Fig. S4 Change of absorption spectra of solution of P(EHMA-ABMA) throughout the light irradiation with the passage of time after addition of CoS. The spectrum (yellow) observed in a few seconds did not change all through the process. For the other spectra, one was measured with solution of CoS only (blue), another (red) was measured with solution of P(EHMA-(Z)-ABMA) without CoS at photo-stationary state, and the sum (green) of these by simple addition of the two spectra (red + blue).