

Electronic Supporting Information (ESI)

Facile synthesis of poly(N-vinyl pyrrolidone) block copolymers with “more-activated” monomers by using photoinduced successive RAFT polymerization

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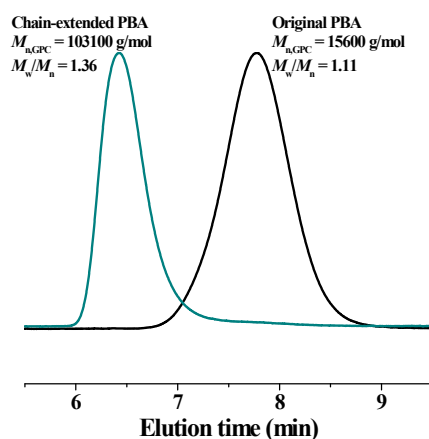


Fig. S1 GPC traces of (a) PBA homopolymer mediated by PXPE and (b) chain extensions with fresh BA under irradiation with purple LED light at room temperature (25 °C). Polymerization conditions: $[BA]_0/[PBA]_0 = 1000/1$, $V_{BA} = 0.5$ mL, bulk, under irradiation with purple LED light (0.6 mW/cm², $\lambda_{max} = 391$ nm), $t = 20$ min, conversion = 65.5%. For PBA macro-RAFT agent: $M_{n,GPC} = 15600$ g/mol, $M_w/M_n = 1.11$.

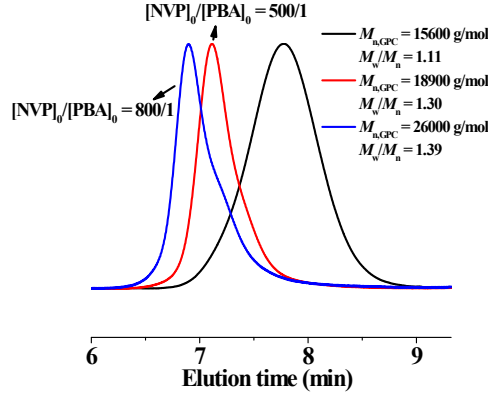


Fig. S2 GPC traces of the PBA homopolymer and corresponding PBA-*b*-PNVP block copolymers after chain extension. Polymerization conditions: $[NVP]_0/[PBA]_0 = X/1$ ($X = 500$ ($t = 2.5$ h, conversion = 24.4%), 800 ($t = 2.5$ h, conversion = 31.1%)), $V_{BA} = 0.5$ mL, bulk, under irradiation with purple LED light (0.6 mW/cm², $\lambda_{max} = 391$ nm), 25 °C. For PBA macro-RAFT agent: $M_{n, GPC} = 15600$ g/mol, $M_w/M_n = 1.11$.

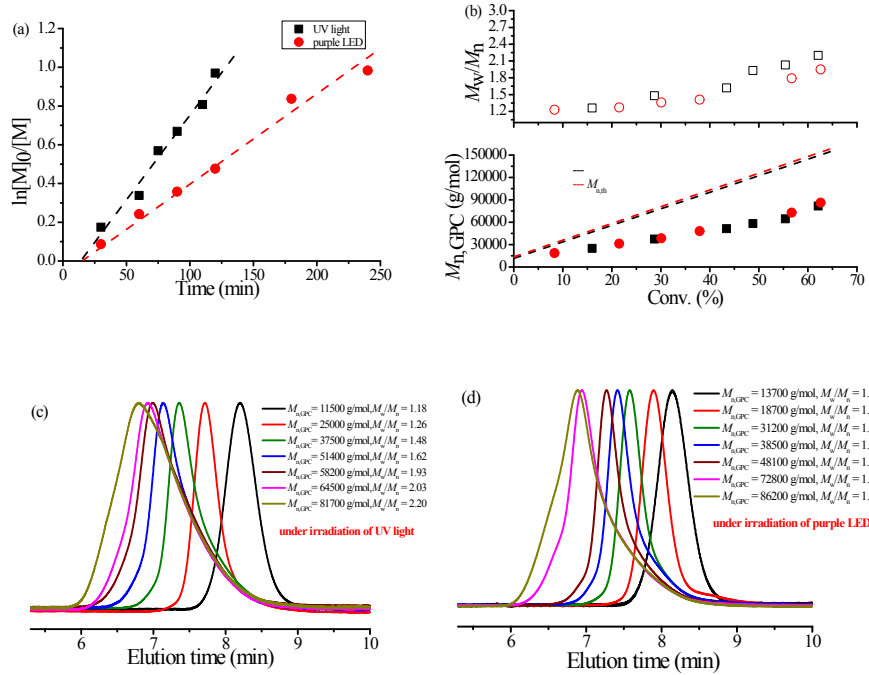


Fig. S3 (a) $\ln([M]_0/[M])$ as a function of time, (b) number-average molecular weight ($M_{n, GPC}$) and molecular weight distribution (M_w/M_n) versus monomer conversion, (c) and (d) GPC traces of the PBA homopolymers mediated by PXPE and its corresponding PBA-*b*-PNVP block copolymers after chain-extension. Polymerization conditions: $[NVP]_0/[PBA]_0 = 2000/1$, $V_{NVP} = 0.5$ mL, 25 °C, bulk, under irradiation with UV light (9.6 mW/cm², $\lambda_{max} = 365$ nm) and purple LED light (0.6 mW/cm², $\lambda_{max} = 391$ nm). For PBA macro-RAFT agent: $M_{n, GPC} = 11500$ g/mol, $M_w/M_n = 1.18$ and $M_{n, GPC} = 13700$ g/mol, $M_w/M_n = 1.14$.

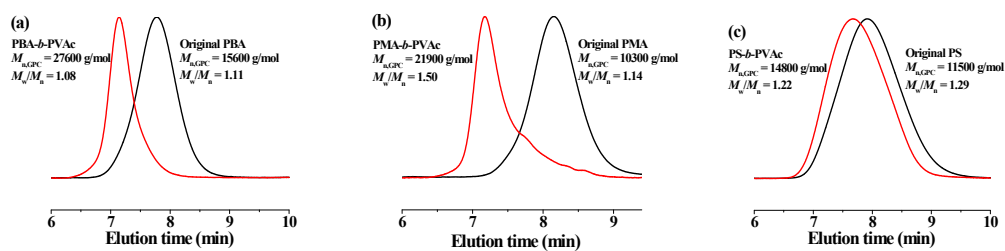


Fig. S4 GPC traces of (a) PBA-*b*-PVAc ($t = 22$ h, conversion = 16.1%), (b) PMA-*b*-PVAc ($t = 22$ h, conversion = 22.5%) and (c) PS-*b*-PVAc ($t = 22$ h, conversion = 4.7%) copolymers using PBA, PMA and PS as the macro-RAFT agent, respectively. Polymerization conditions: $[M]_0/[macro-RAFT\ agent]_0 = 1000/1$, $V_M = 0.5$ mL, bulk, under irradiation with purple LED (0.6 mW/cm^2 , $\lambda_{max} = 391\text{ nm}$), $25\text{ }^\circ\text{C}$.