Supporting Information

Synthesis of High Refractive Index Polymer with Pendent Selenium-containing Maleimide and Using as Redox Sensor

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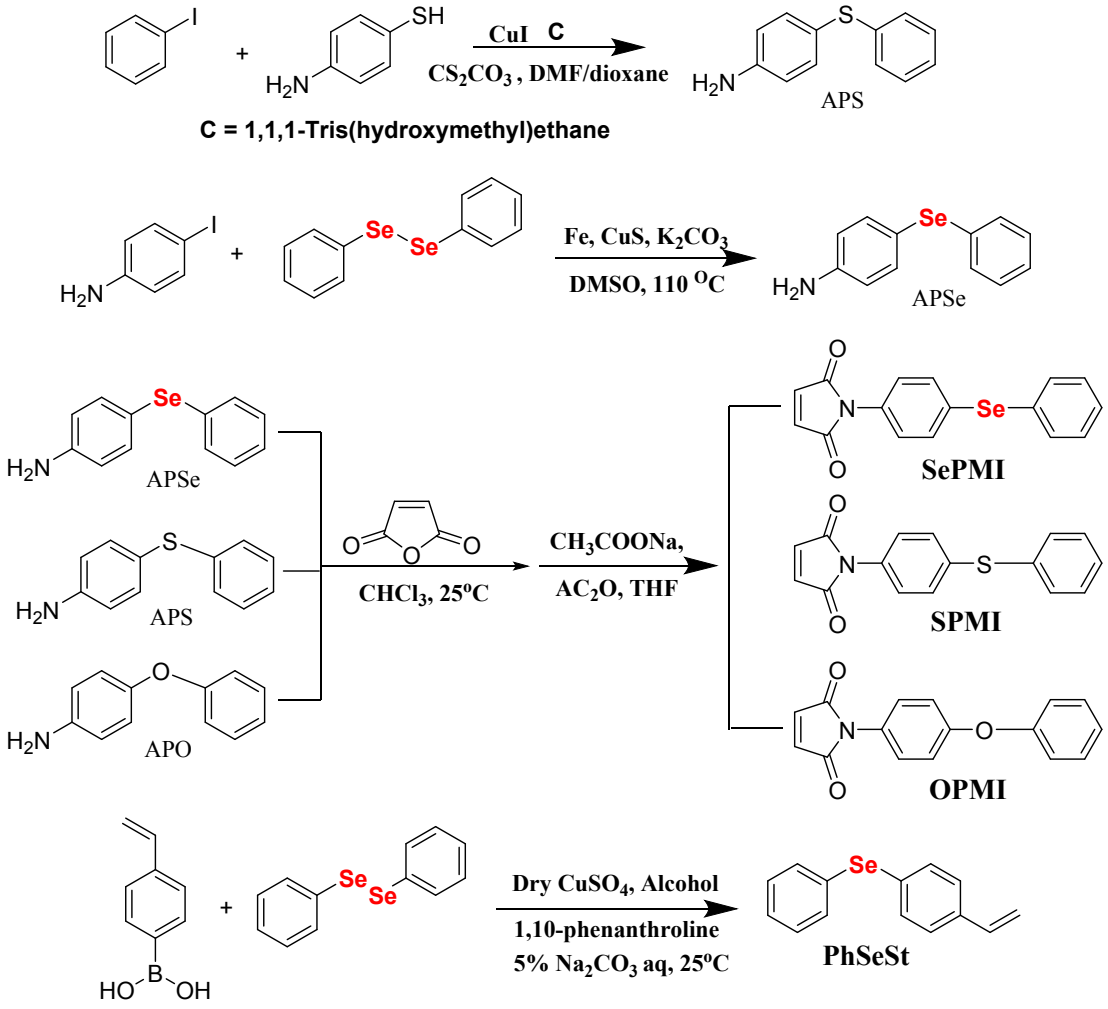


Scheme S1. Synthetic routes of monomers and intermediates referred to the ever-reported literature and optimized the reaction condition.

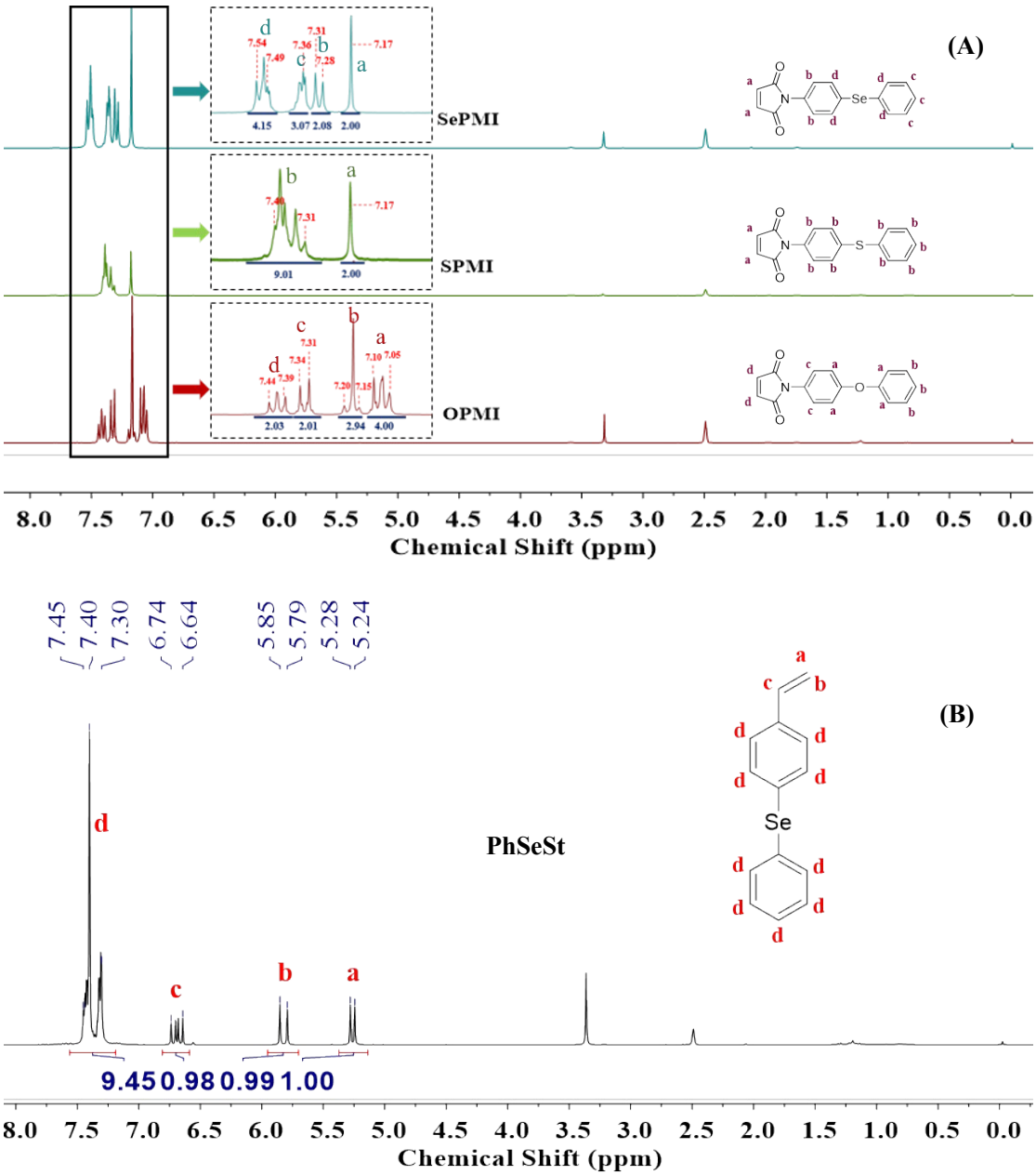
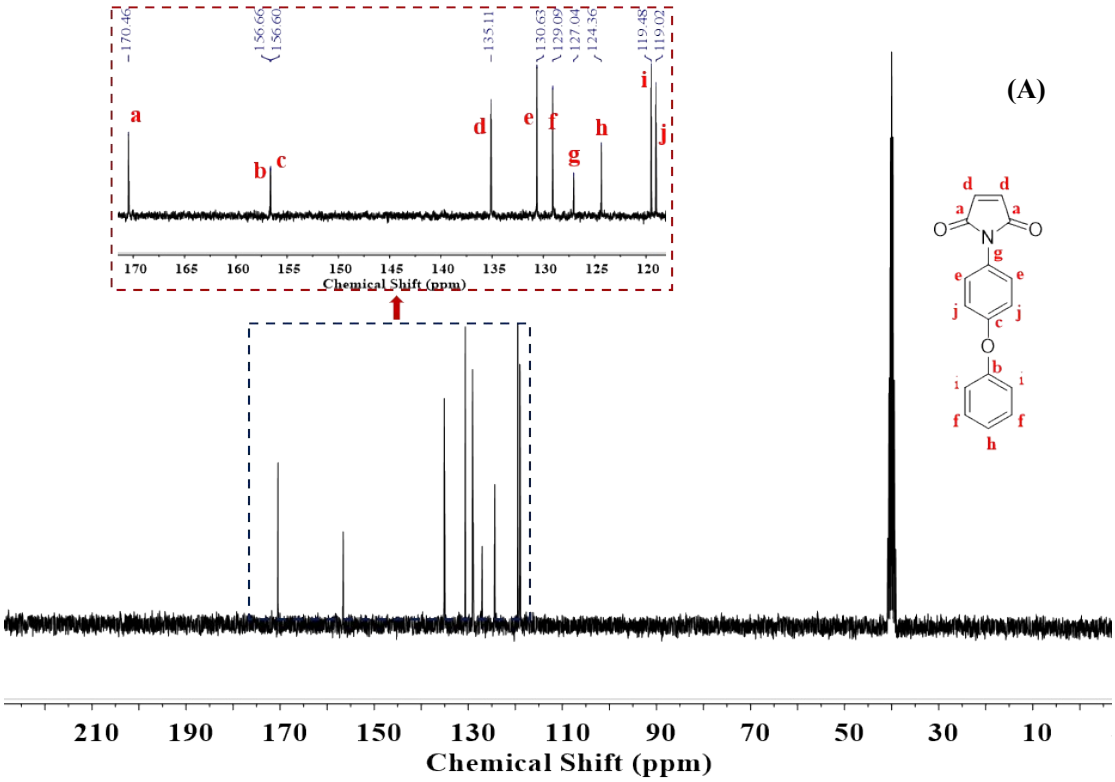
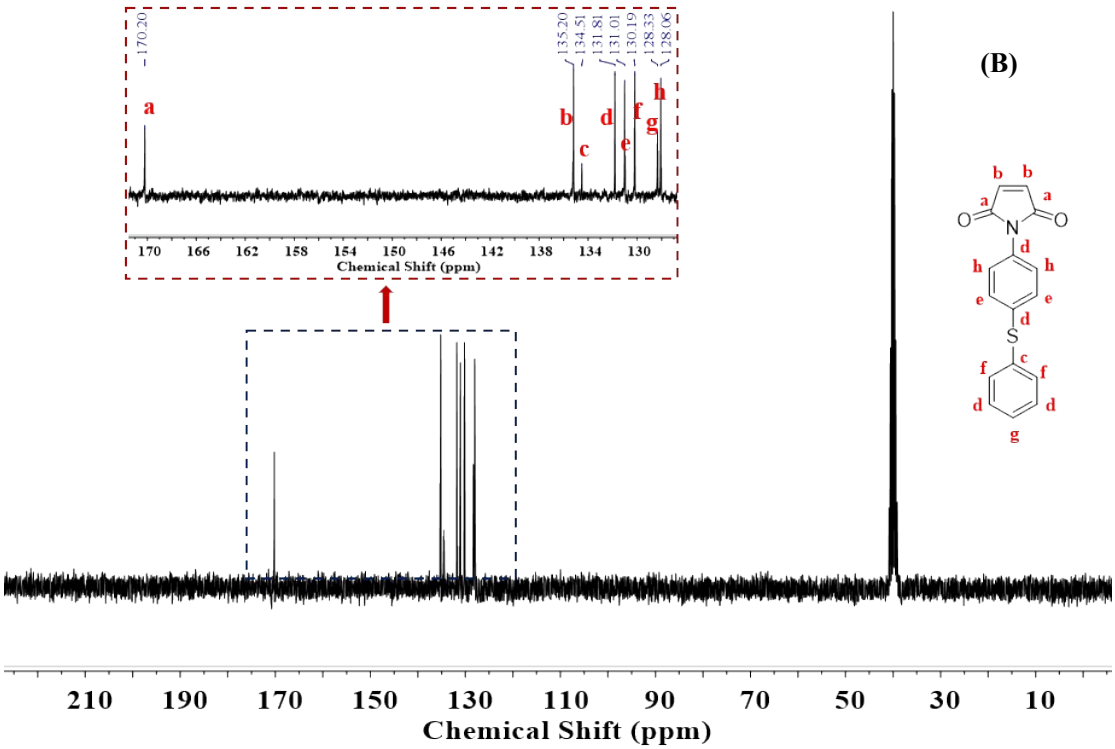


Figure S1. (A) ^{1}H NMR of three maleimides (OPMI, SPMI and SePMI) in DMSO-d_6; (B) ^{1}H NMR of PhSeSt in DMSO-d_6.


(A)
170.46
156.66
156.60
135.11
130.63
129.09
127.04
124.36
119.48
119.02
a
b
c
d
e
f
g
h
i
j
170 165 160 155 150 145 140 135 130 125 120
Chemical Shift (ppm)
210 190 170 150 130 110 90 70 50 30 10
Chemical Shift (ppm)


(B)
170.20
135.20
134.51
131.81
131.01
130.19
128.33
128.06
a
b
c
d
e
f
g
h
170 166 162 158 154 150 146 142 138 134 130
Chemical Shift (ppm)
210 190 170 150 130 110 90 70 50 30 10
Chemical Shift (ppm)

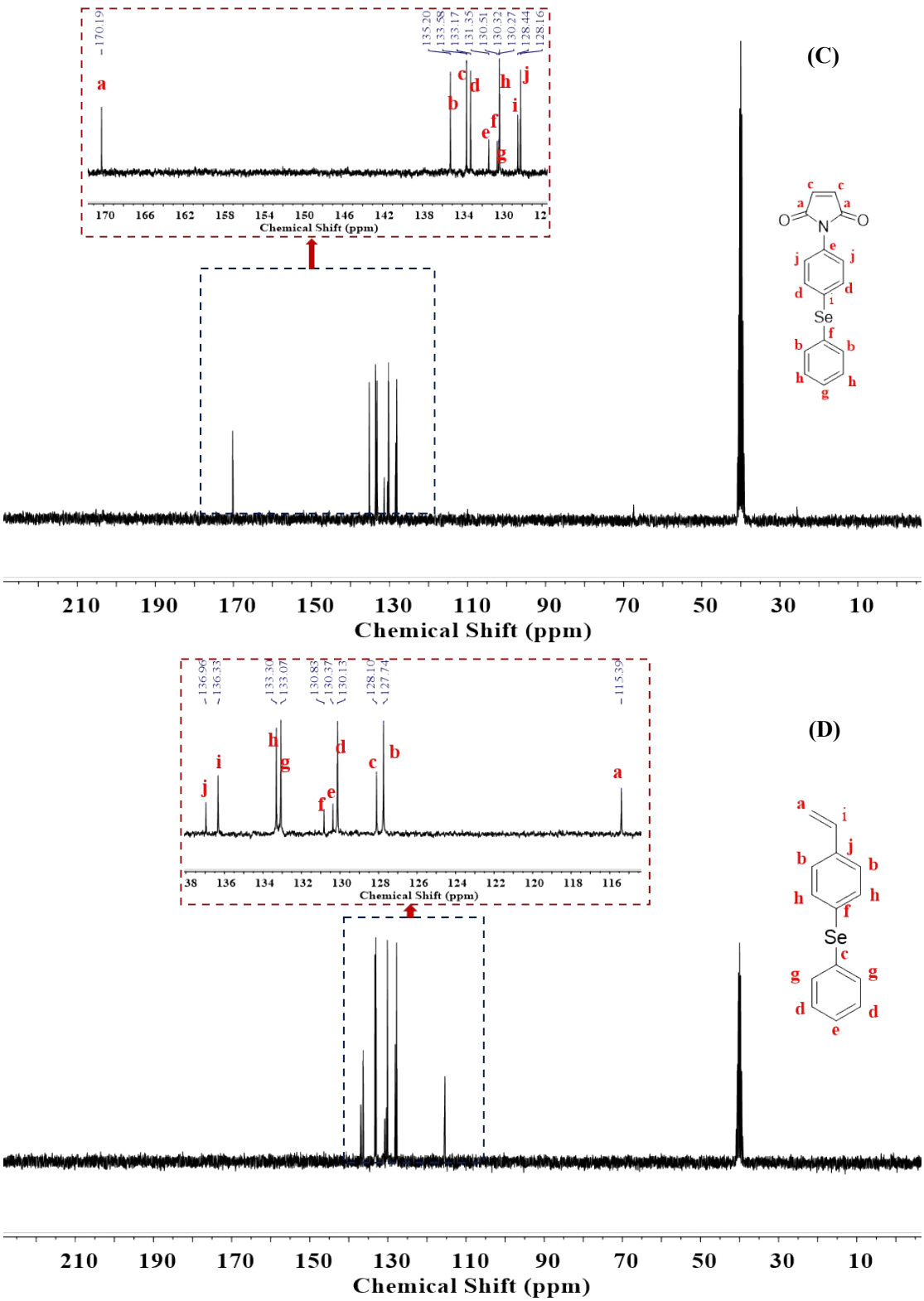


Figure S2. ^{13}C NMR of four monomers in DMSO-d_6 (A, OPMI; B, SPMI; C, SePMI; D, PhSeSt).

Result and discussion

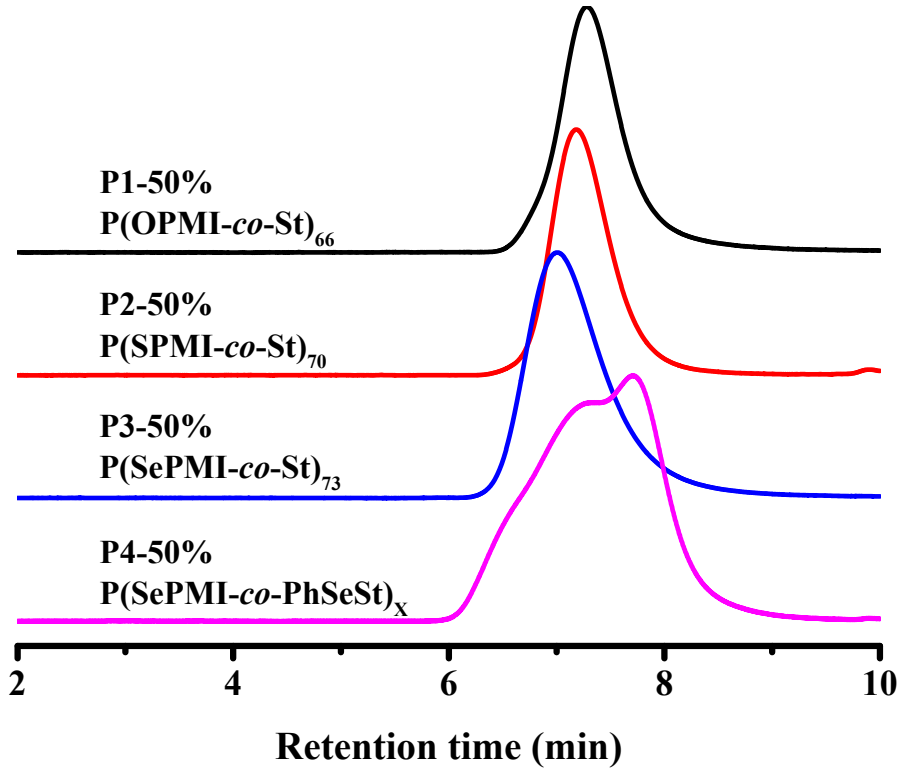


Figure S3. The GPC trace of four copolymers (P1-50% to P4-50%) in DMF and PS used as standard.

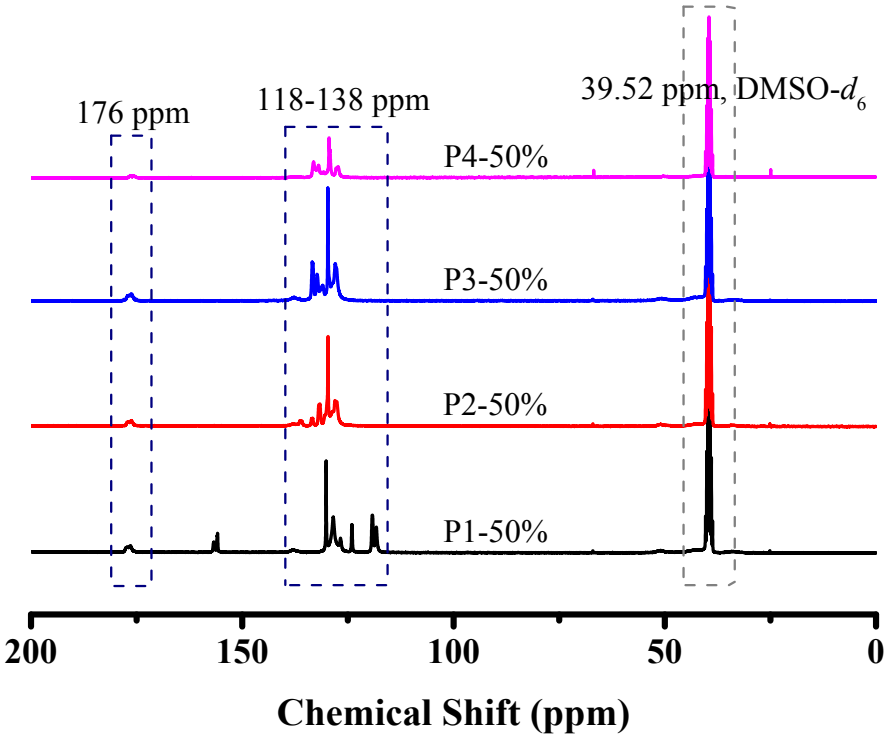


Figure S4. ^{13}C NMR of four copolymers (P1-50% to P4-50%) in DMSO-d_6.

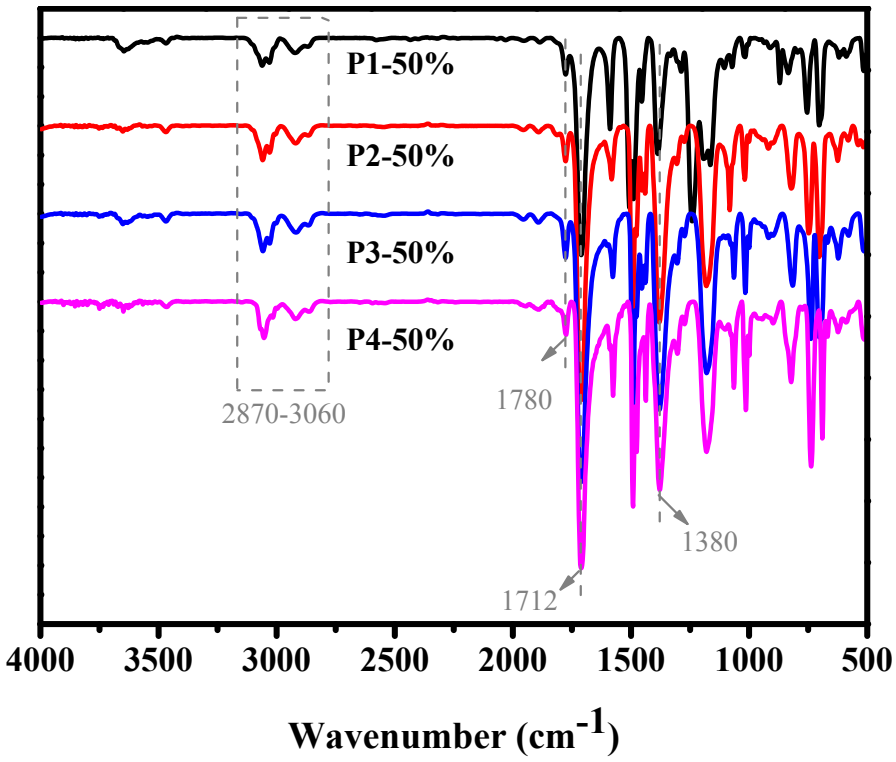


Figure S5. FT-IR spectra of four copolymers (P1-50% to P4-50%) with different MI and St or PhSeSt in equal molar ratio.

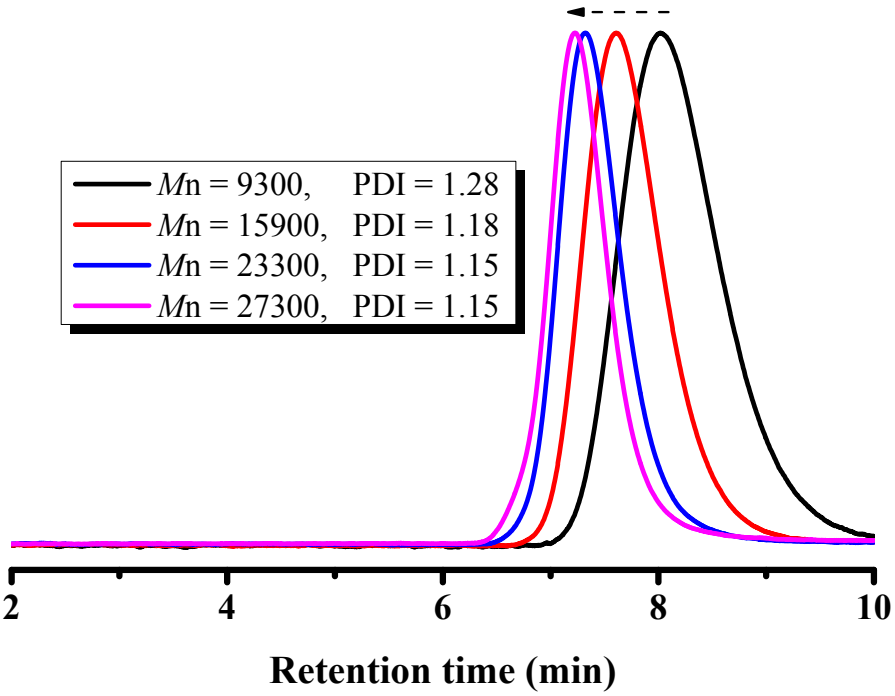


Figure S6. GPC trace of P3-50% with different molecular weight.

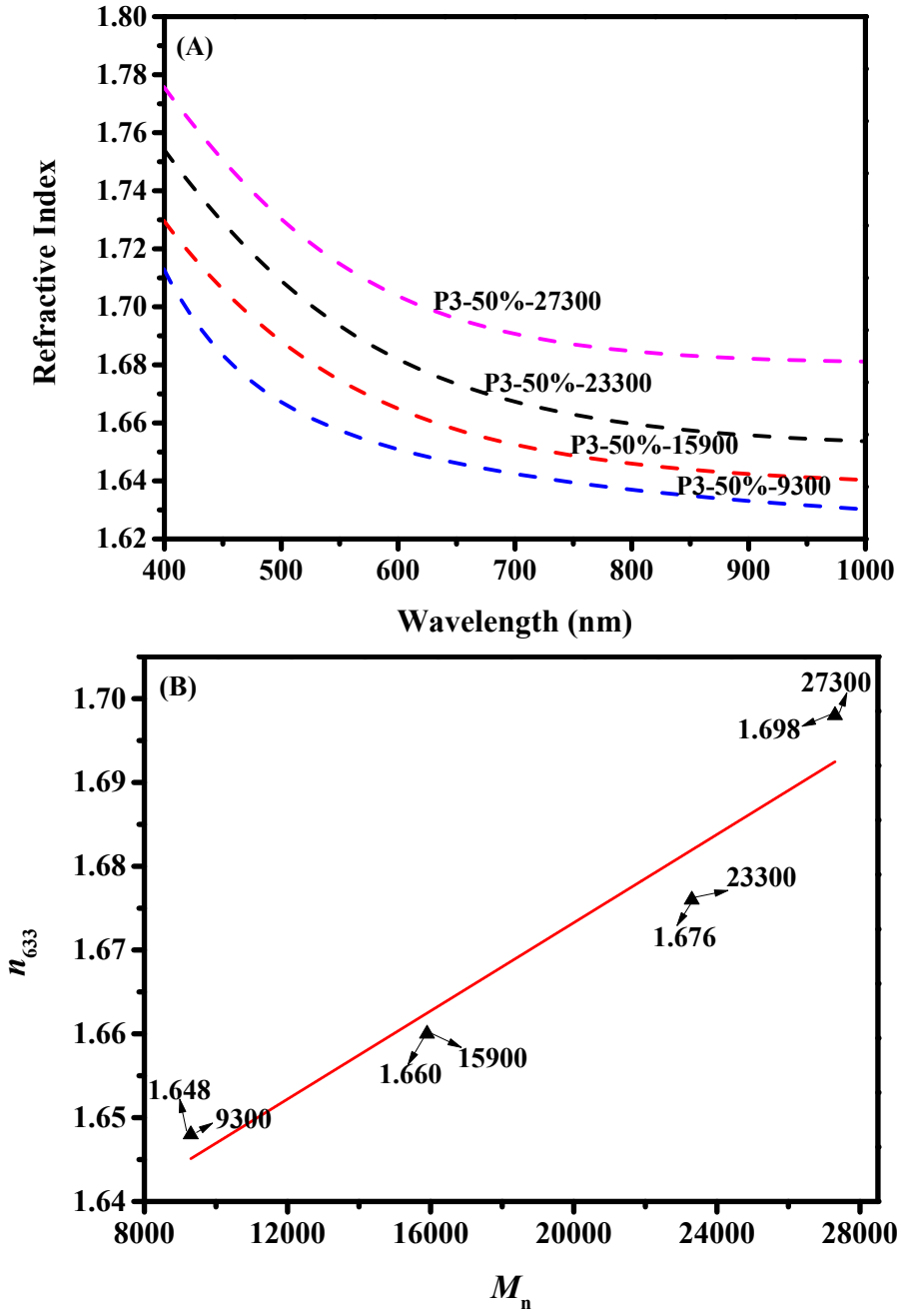


Figure S7. (A) RI curves of P3-50% with different molecular weight; (B) liner relation of M_n and RI at 633nm.

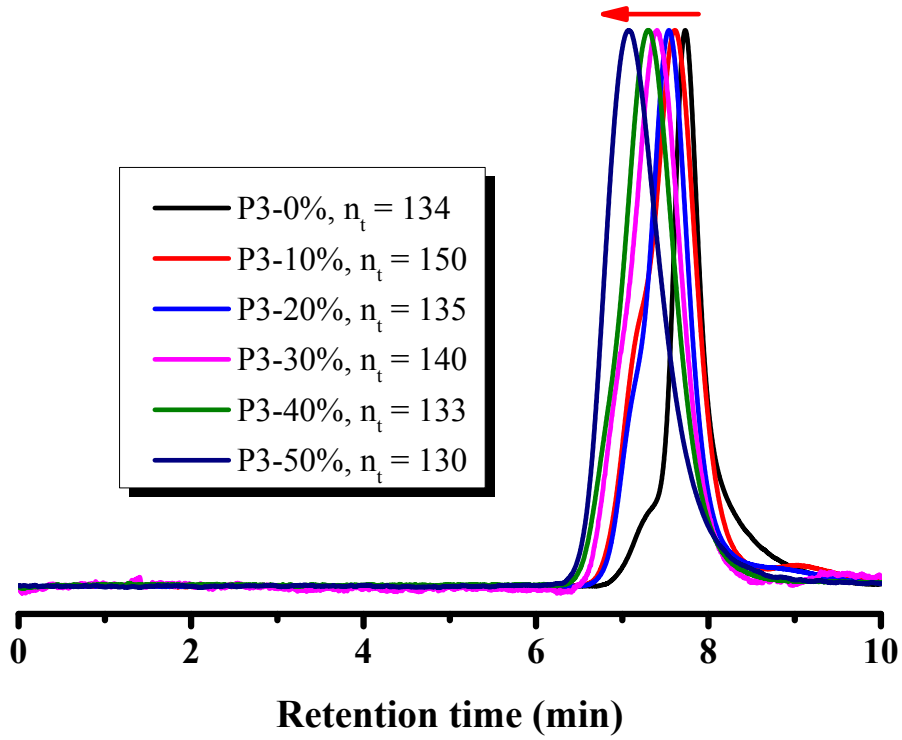


Figure S8. GPC trace of copolymers with different molar ratios in DMF and PS used as standard (n_t means total degree of polymerization).

Table S1. The summary of molecular weight, degree of polymerization and polydispersity index of P3s with different monomer ratios.

Entry	Monomer Ratios SePMI : St	$M_{n,SEC}$	m_1	m_2	n_t	M_w/M_n
P3-50%	50 : 50	28300	65	65	130	1.26
P3-40%	40 : 60	25700	53	80	133	1.18
P3-30%	30 : 70	24000	42	98	140	1.16
P3-20%	20 : 80	20100	27	108	135	1.13
P3-10%	10 : 90	19000	15	135	150	1.19
P3-0%	0 : 100	14000	0	134	134	1.18

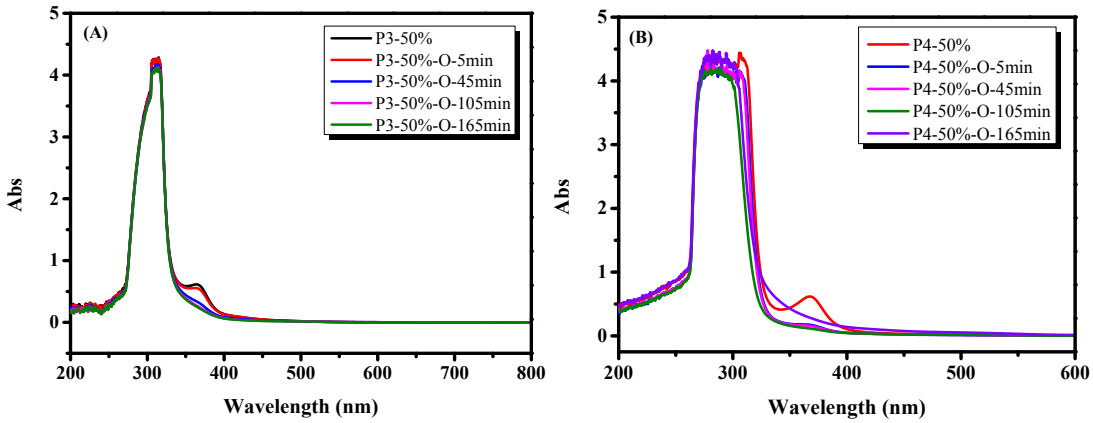


Figure S9. UV-*vis* spectra of the solution of P3-50% and P4-50% oxidated in 30% H_2O_2 with different time.

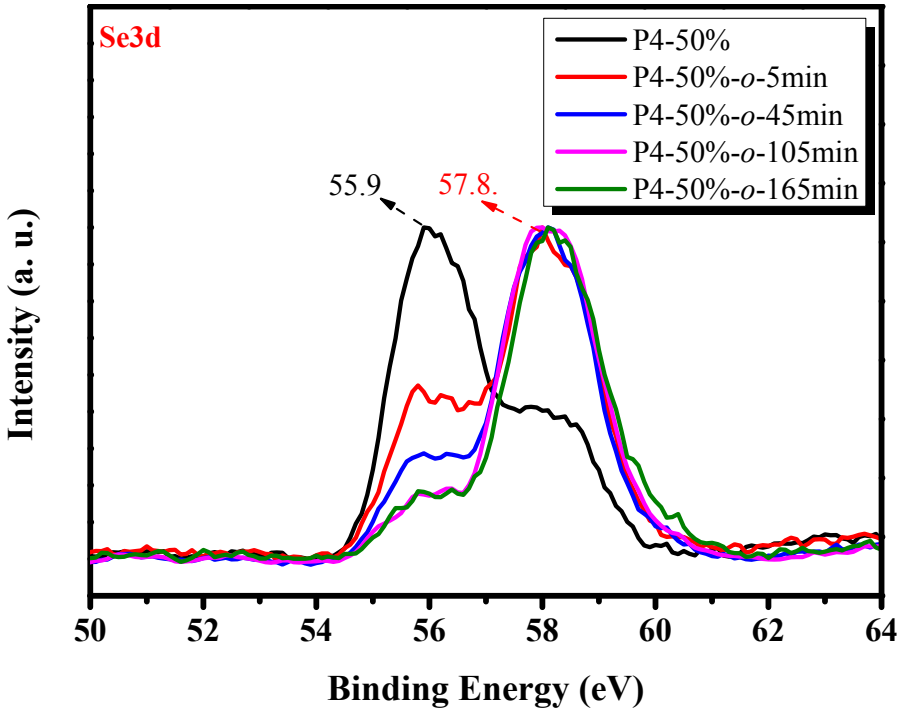


Figure S10. XPS data of P4-50% oxidized with different times.

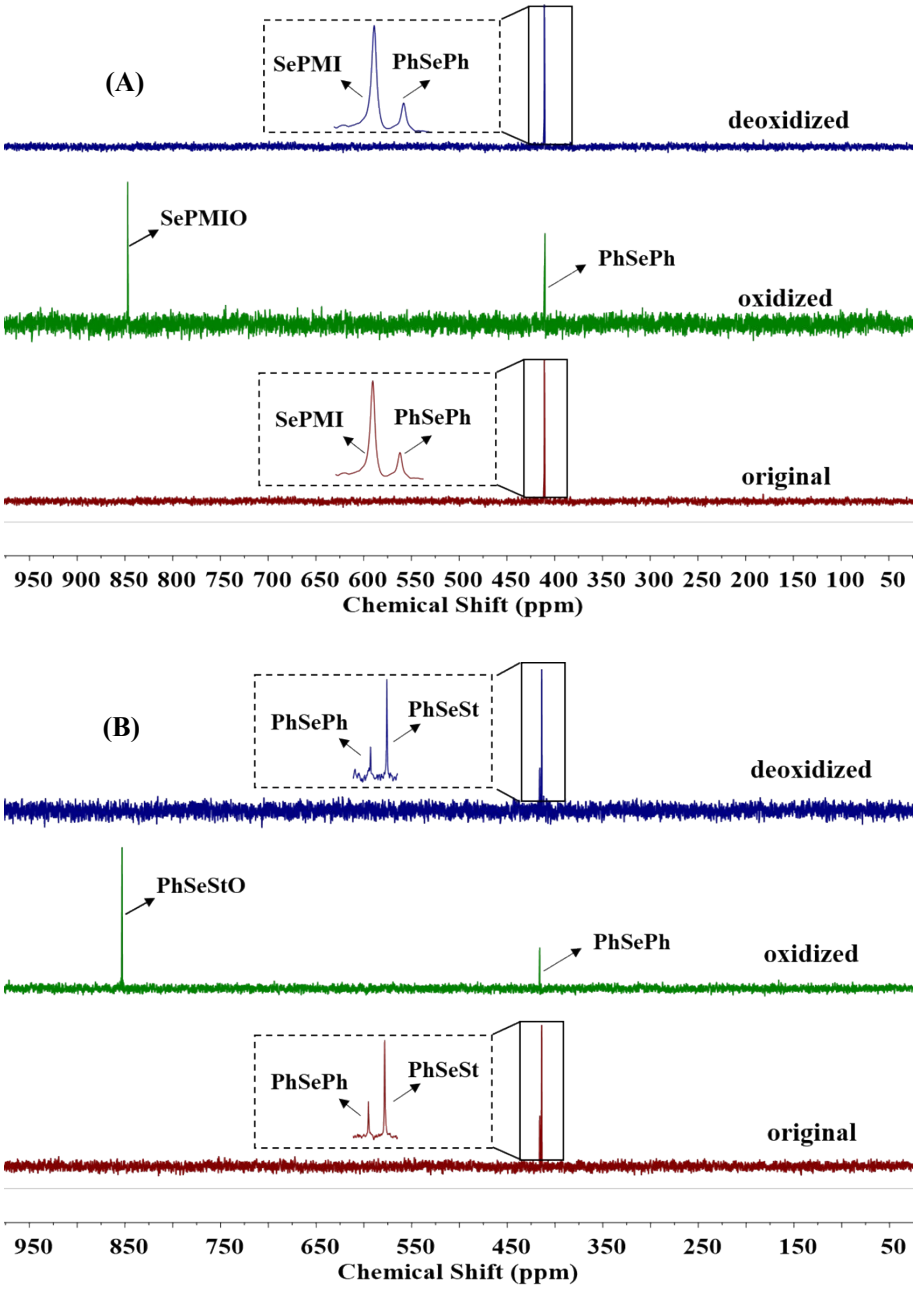


Figure S11. ^{77}Se NMR of SePMI (A) and PhSeSt (B) oxidized and reoxidized.

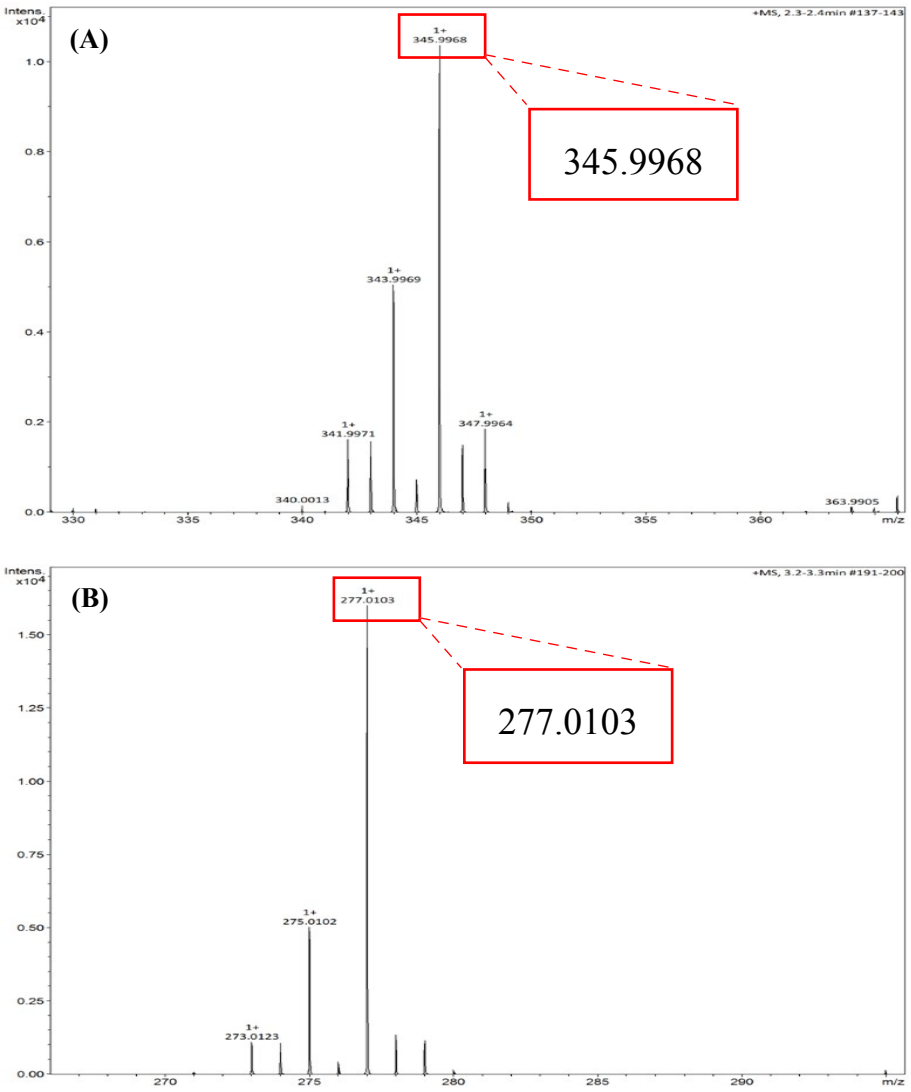


Figure S12. Mass spectra of oxidized SePMI and oxidized PhSeSt

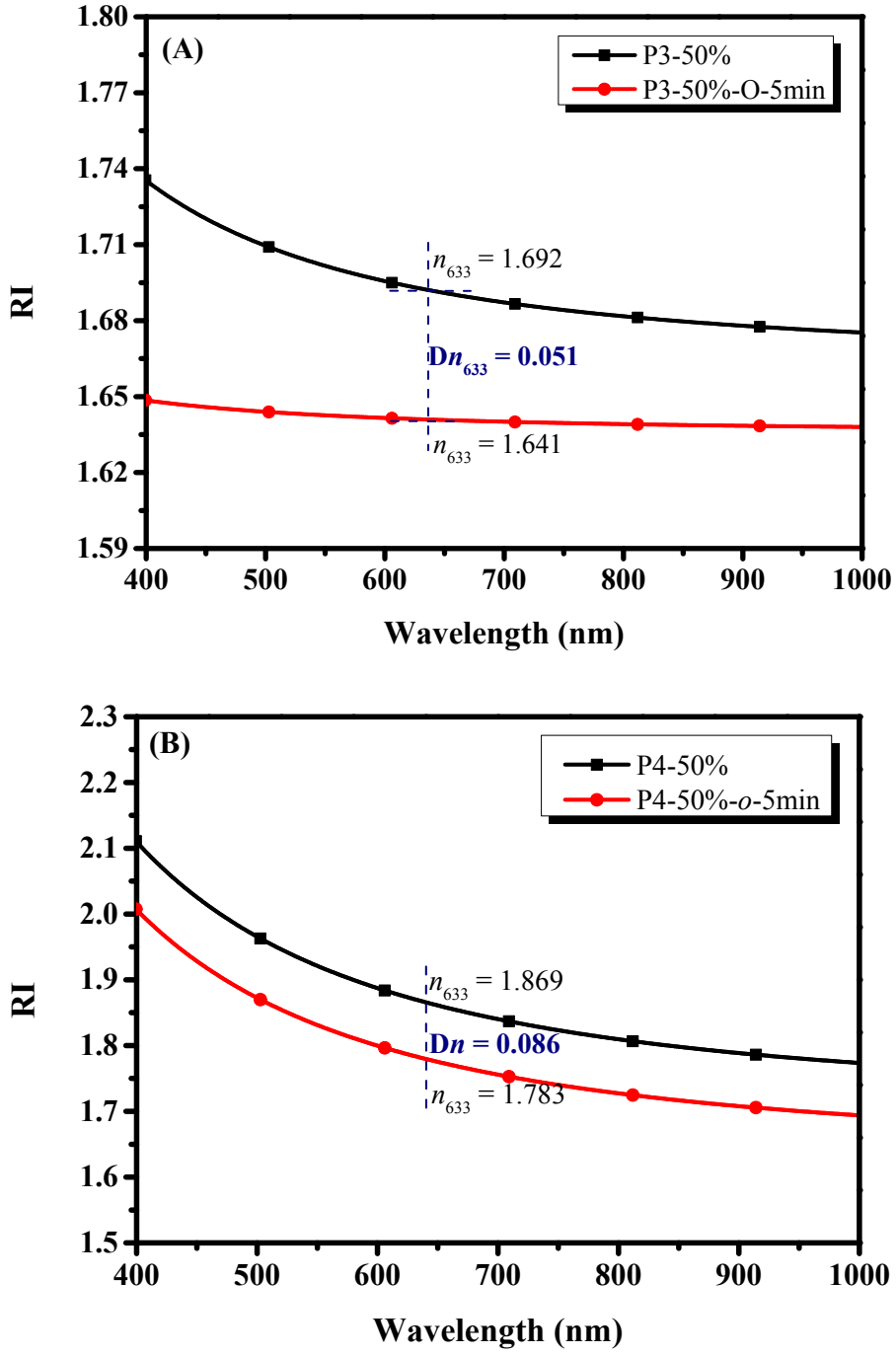


Figure S13. RI change of P3-50% and P4-50% oxidized with 30% H_2O_2.