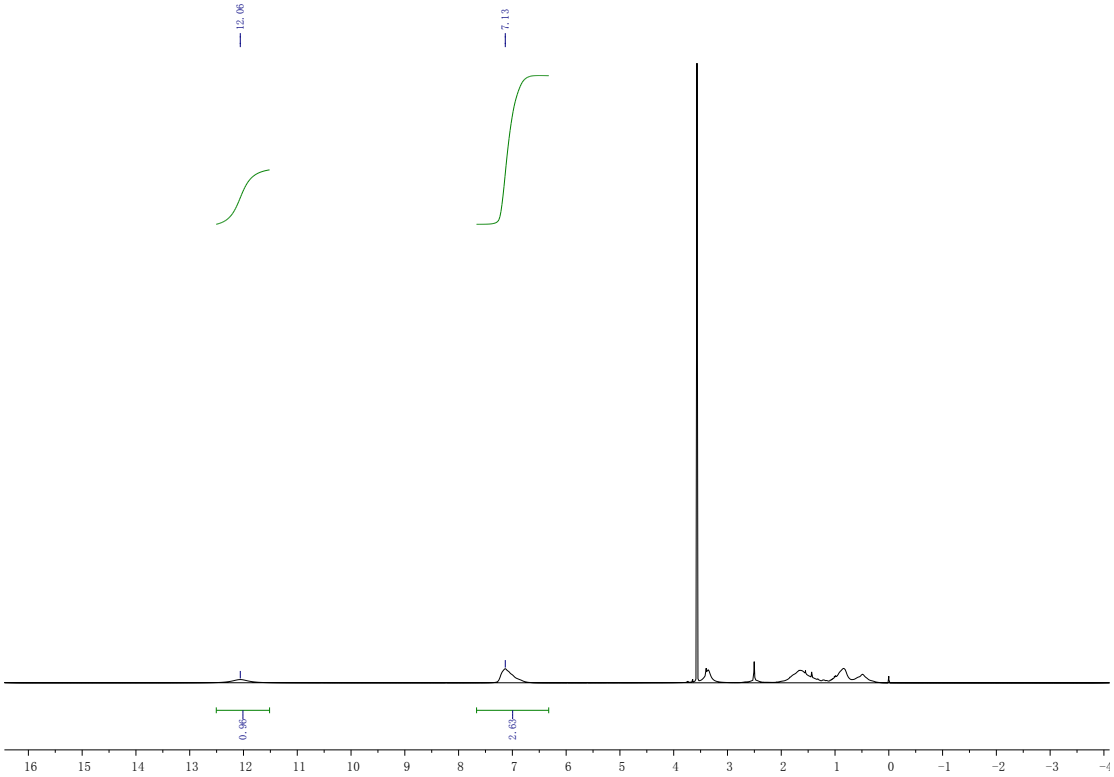
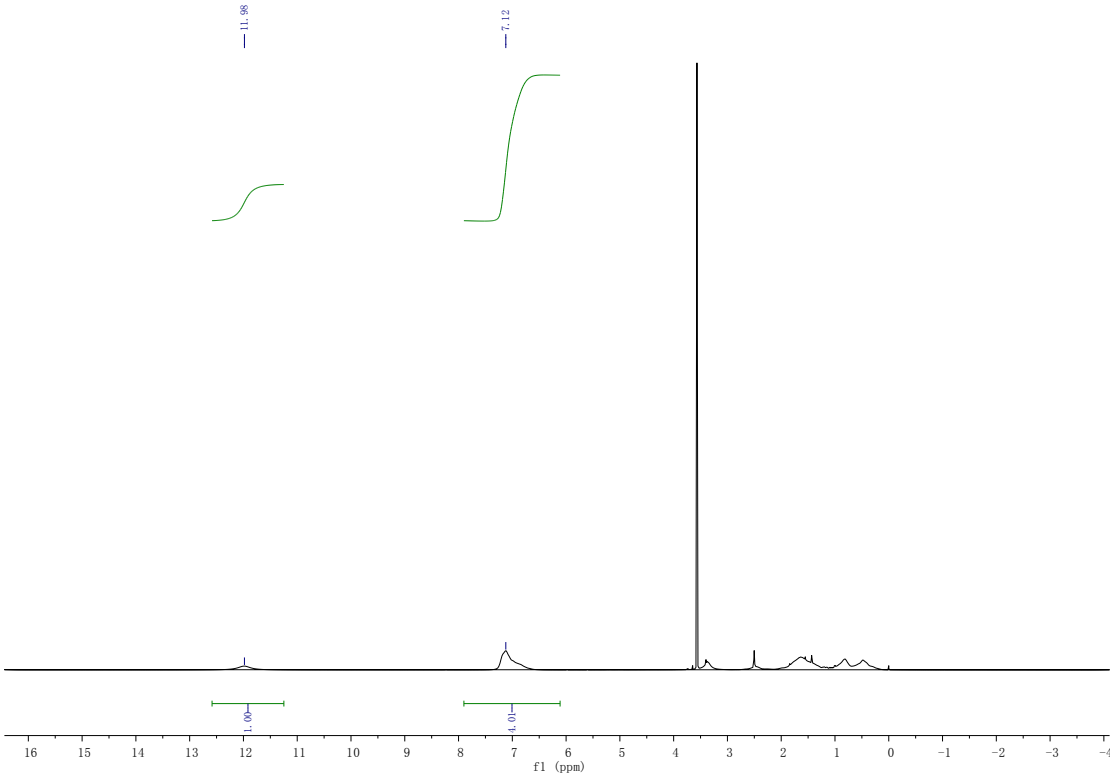
Electronic Supplementary Material (ESI) for RSC Advances.

1、^{1}H-NMR

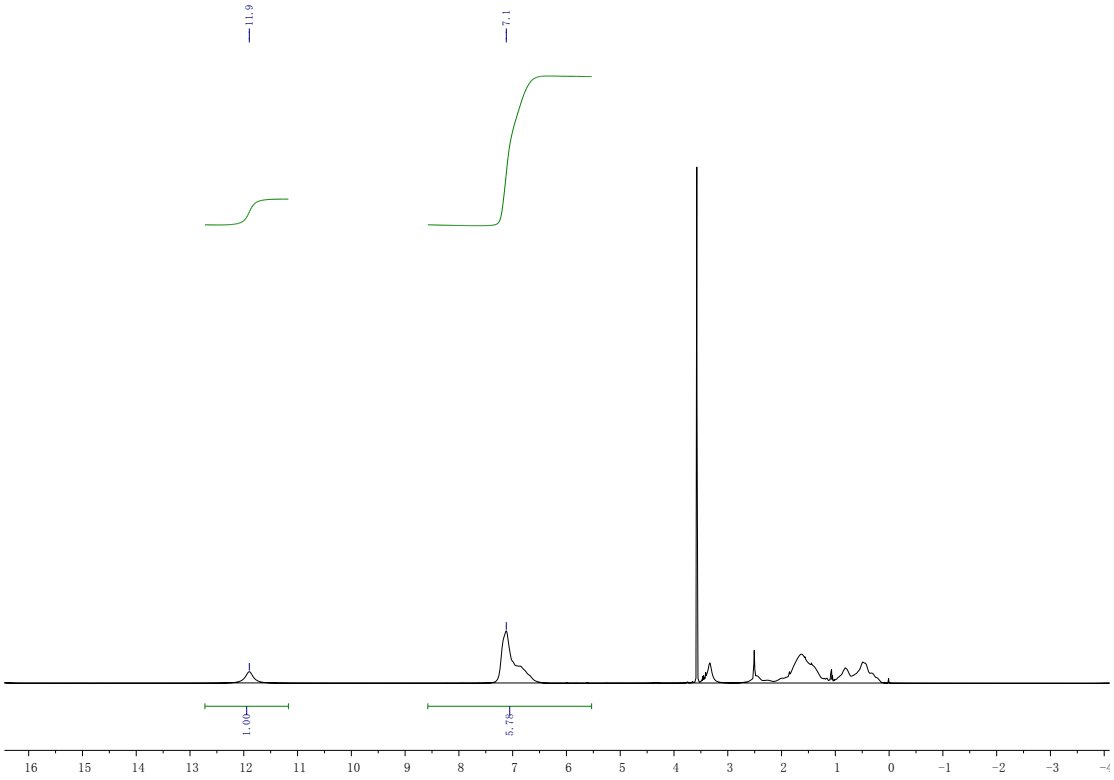
1.1 ^{1}H–NMR of P(St-*co*-MAA)(3:7)



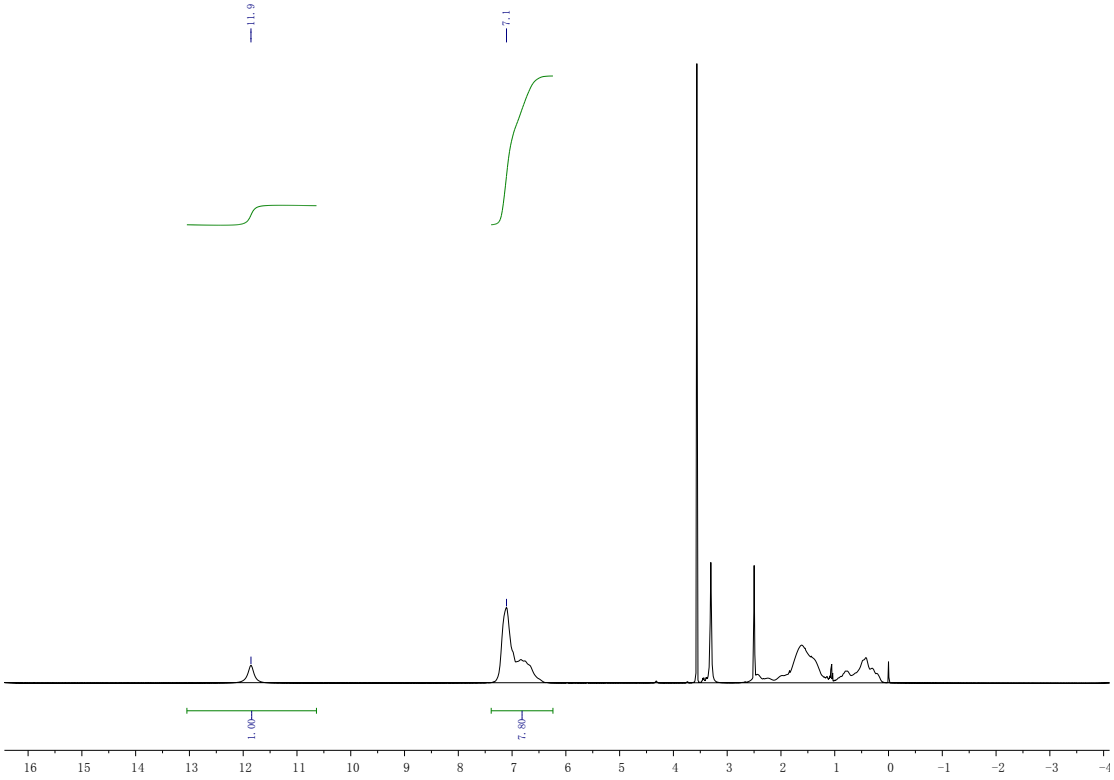
1.2 ^{1}H–NMR of P(St-*co*-MAA)(4:6)



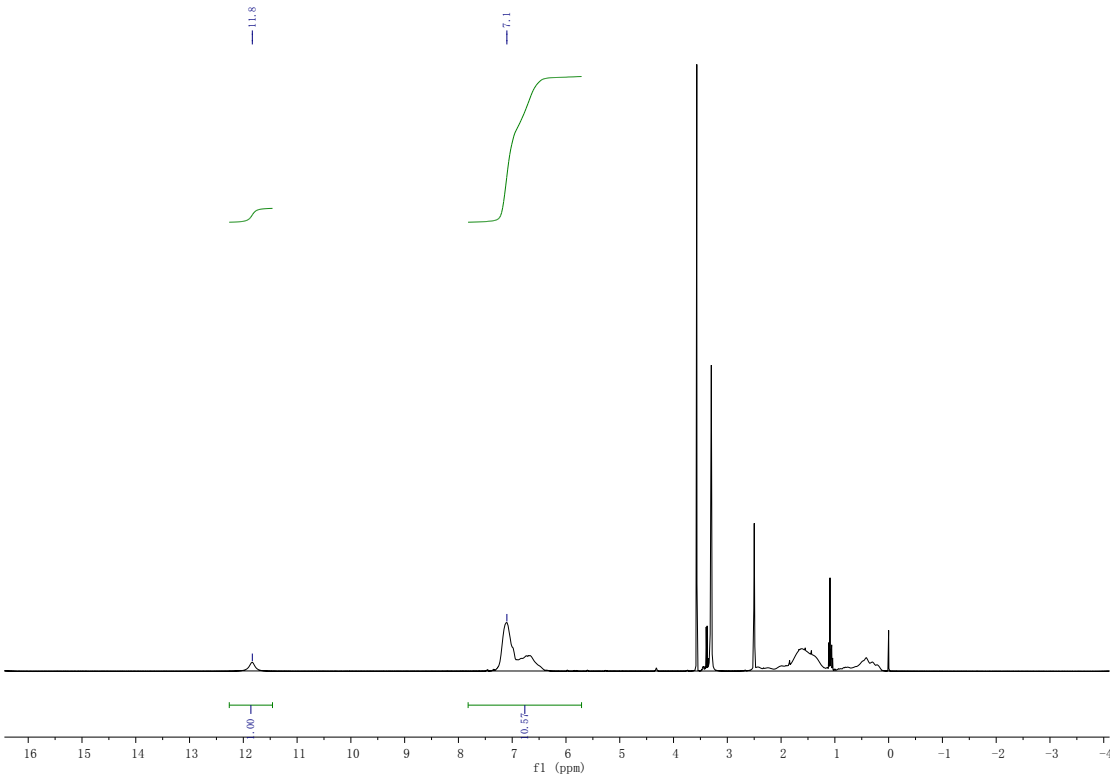
1.3 ^{1}H−NMR of P(St-*co*-MAA)(5:5)



1.4 ^{1}H−NMR of P(St-*co*-MAA)(6:4)



1.5 ^{1}H−NMR of P(St-*co*-MAA)(7:3)



We can calculate the actual molar ratio of St to MAA by ^{1}H-NMR spectra. Formula is as follows：

$$n_{St} : n_{MAA} = \frac{\frac{1}{5} I_b}{I_a}$$

I_b represents the total peak area of five protons in the mono-substituted benzene ring, I_a represents the peak area of proton in the carboxylic acid。The actual ratio of St and MAA is represented in table below:

The mole feed ratio and the actual ratio of St and MAA in P（St−*co*−MAA）

the mole feed ratio of St and MAA	I_b/I_a	the actual ratio of St to MAA
3:7（0.43:1.00）	2.63:1.00	0.53:1.00
4:6（0.67:1.00）	4.01:1.00	0.80:1.00
5:5（1.00:1.00）	5.78:1.00	1.16:1.00
6:4（1.50:1.00）	7.80:1.00	1.56:1.00
7:3（2.33:1.00）	11.78:1.00	2.35:1.00

2.GPC

Relative molecular weight and its mass distribution of P（St−*co*−MAA）

St:MAA	M_n/（g/mol）	M_w/（g/mol）	M_w/M_n
3:7	55925	64586	1.15
4:6	55568	65721	1.18
5:5	54093	64364	1.19
6:4	54295	63593	1.17
7:3	69073	82333	1.19

3. Yield of Polymer

St:MAA (planned)	St （mol）	MAA（mol）	Idea output	Real output	Yield
3:7	0.15	0.35	41.4	21.38	51.6%
4:6	0.20	0.30	46.6	24.16	51.8%
5:5	0.25	0.25	47.5	23.26	49.0%
6:4	0.30	0.20	48.4	22.51	46.5%
7:3	0.35	0.35	49.3	27.52	55.8%