Supporting Information

Biobased Copoly(acetal-triazole)s with Tunable Degradable Properties

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Table S1. Polymer optimization. Molecular weight of furfural-based copoly(acetal-triazole)s **P2-1** to **P2-5** after 96 h of polymerization.

Polymers	Monomer Ratio		Molar Mass, kg/mol[a]		
	Mol % Feed TPhA:HQA	Mol % ^{1}H NMR TPhA:HQA	$\bar{M}_n$	$\bar{M}_w$	Đ
P2-1	1.00:0.00	1.00:0.00	5.6	15.6	2.8
P2-2	0.70:0.30	0.68:0.32	6.7	19.7	2.9
P2-3	0.50:0.50	0.54:0.46	7.4	19.2	2.6
P2-4	0.30:0.70	0.24:0.76	11.1	22.5	2.0
P2-5	0.00:1.00	0.00:1.00	12.7	26.5	2.1

SEC was used to obtain this data. GPC Condition: $CHCl_3$ + 0.2 M TEA at 40 ºC. Molecular weights in kDa.

Figure S1 TGA data comparing monomers to P2-4.

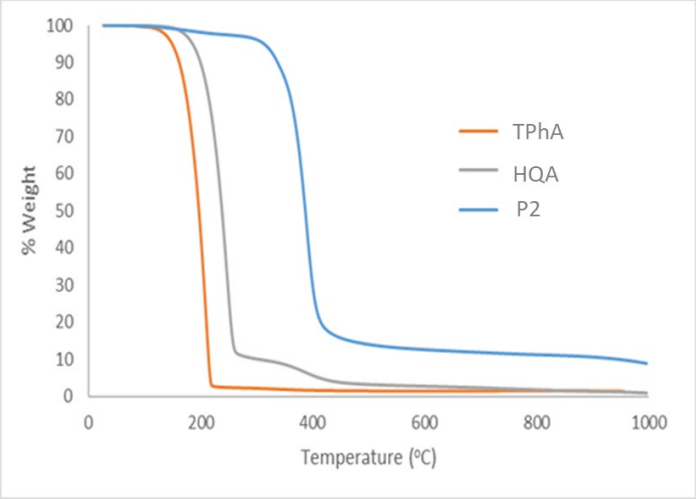
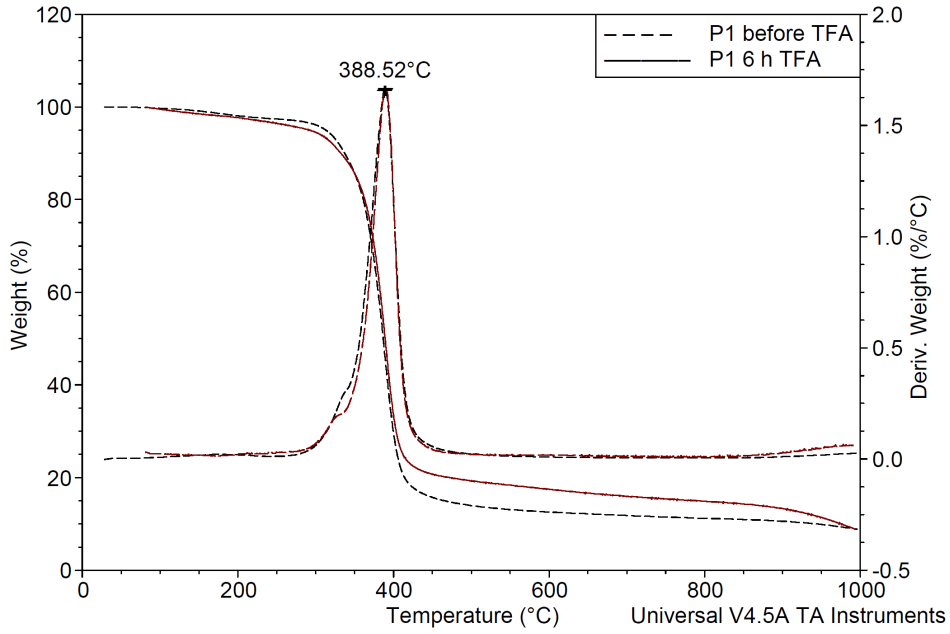
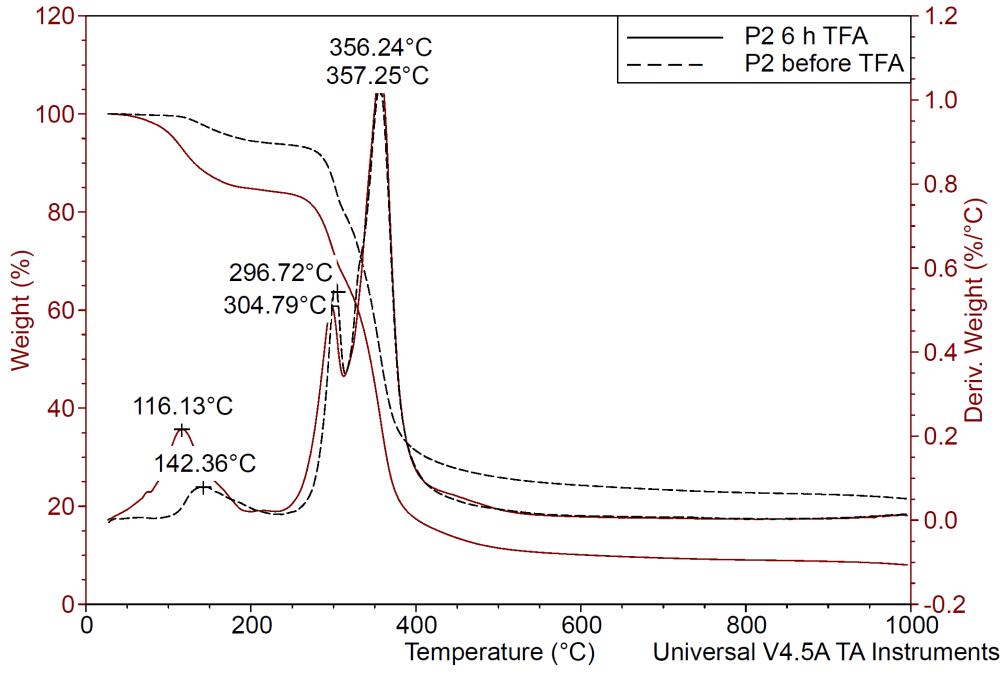


Figure S2 TGA data for P1 – P3

P1



P2



P3

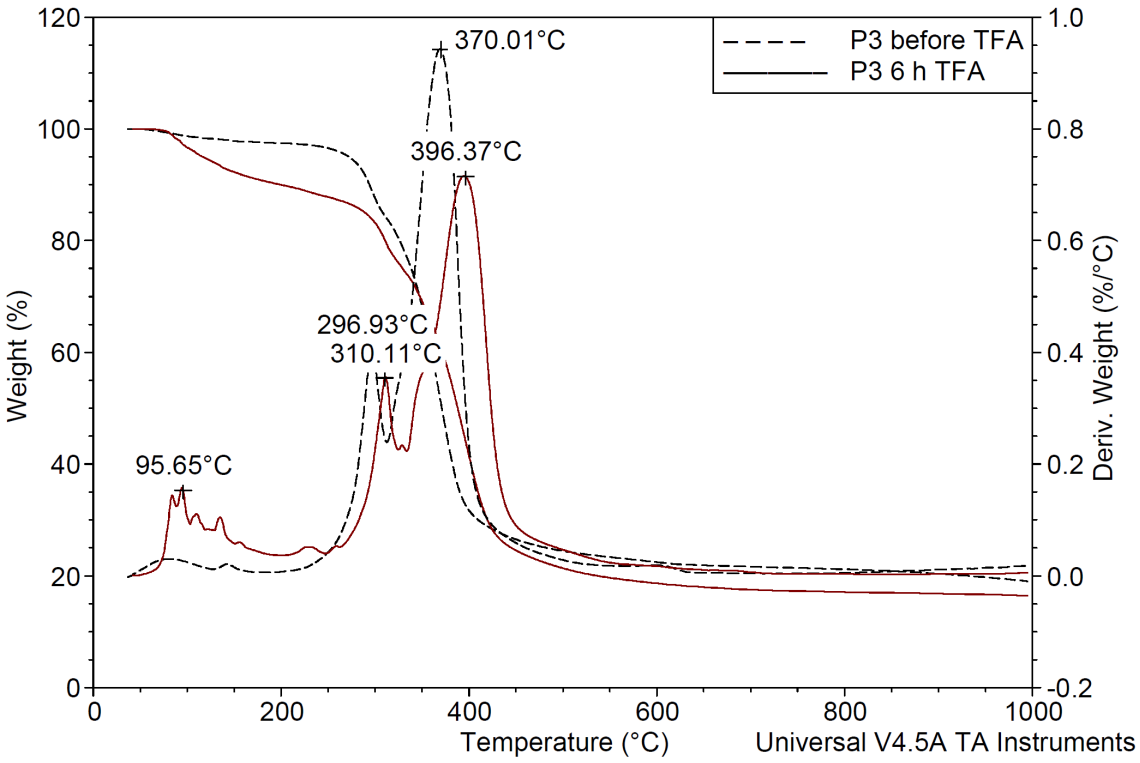
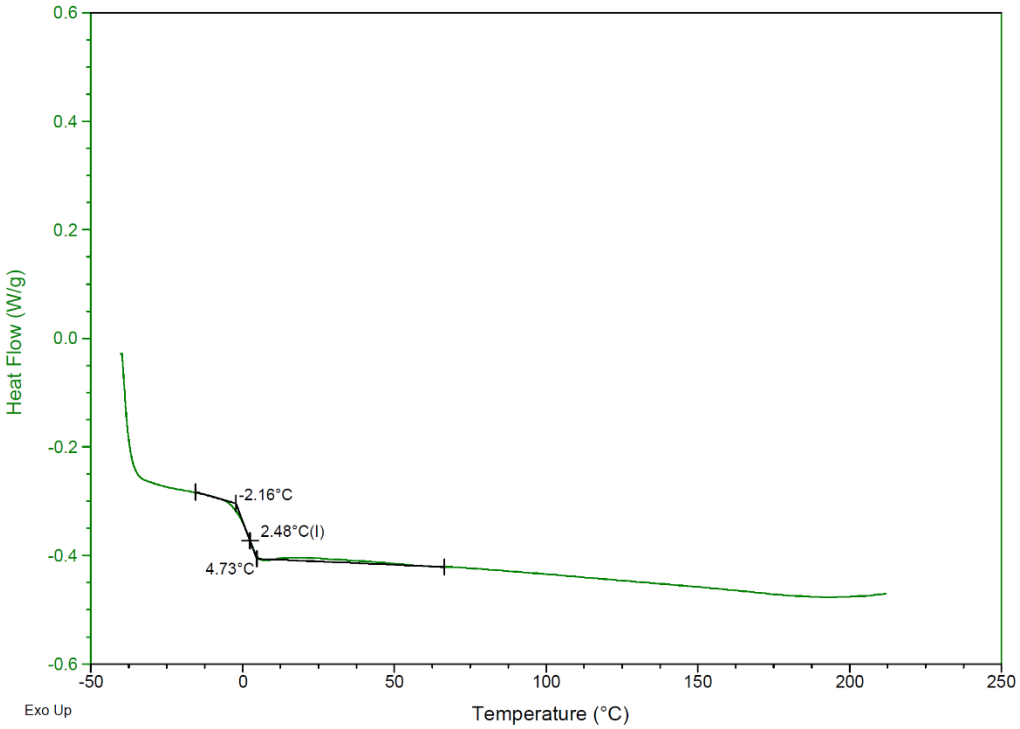
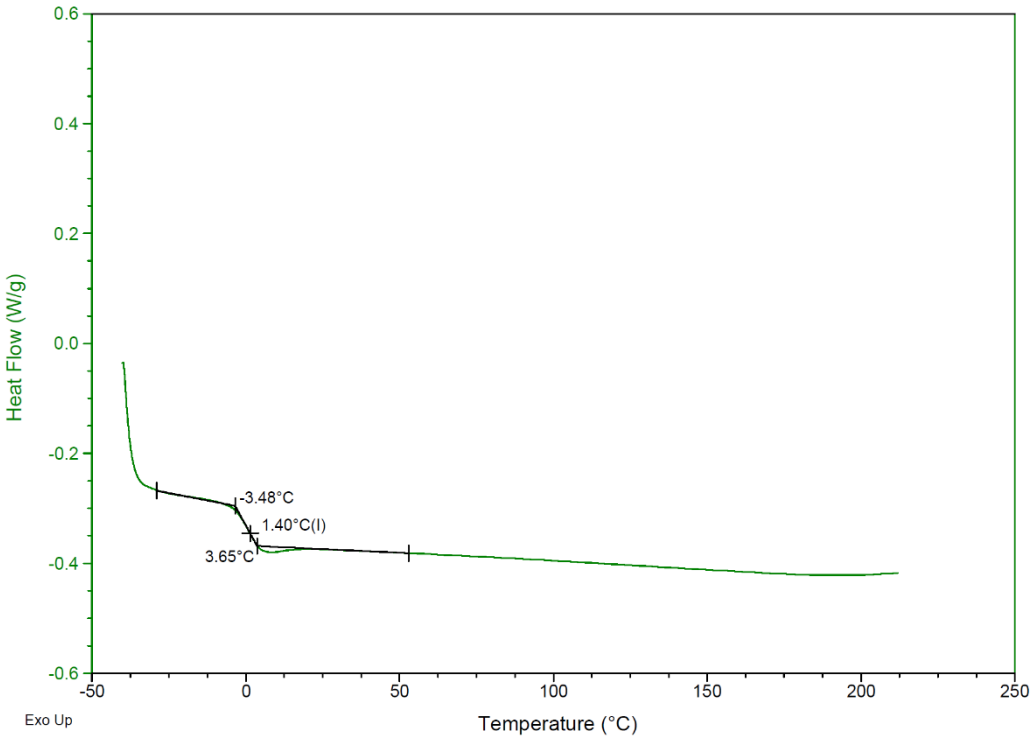

370.01°C
396.37°C
296.93°C
310.11°C
95.65°C
P3 before TFA
P3 6 h TFA
Weight (%)
Deriv. Weight (%/°C)
Temperature (°C)
Universal V4.5A TA Instruments

Figure S3 DSC for P1 – P3

P1



P2



P3

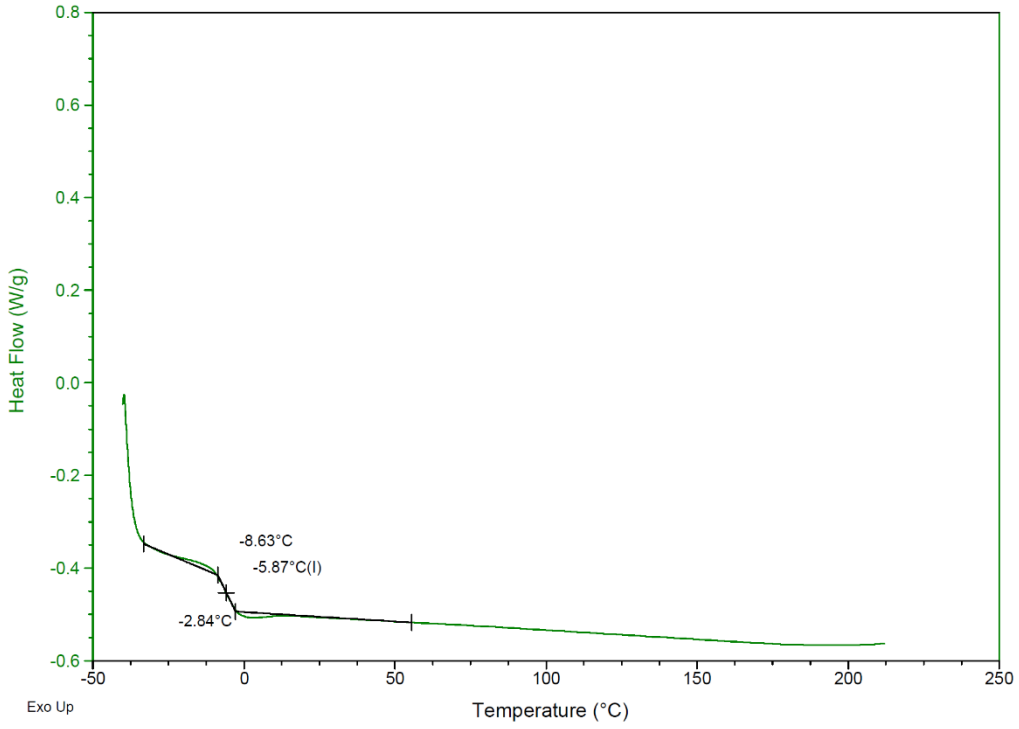
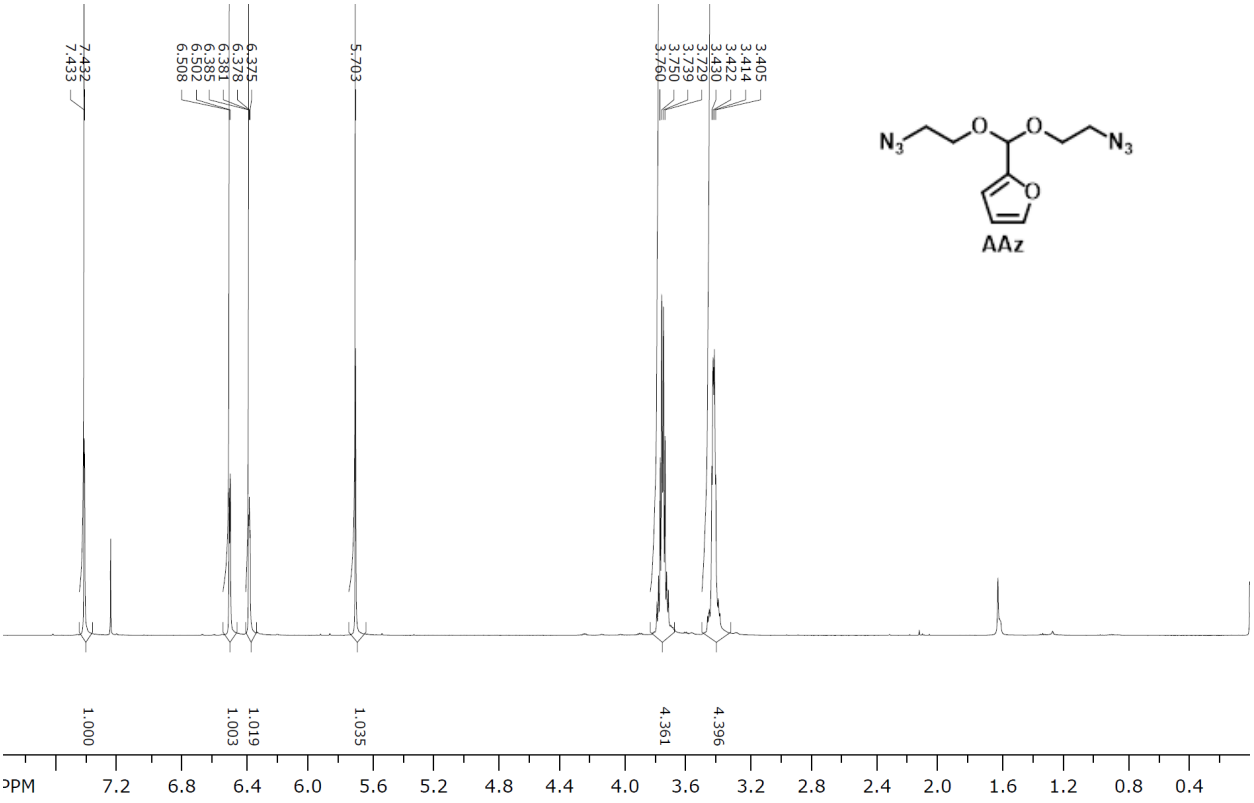
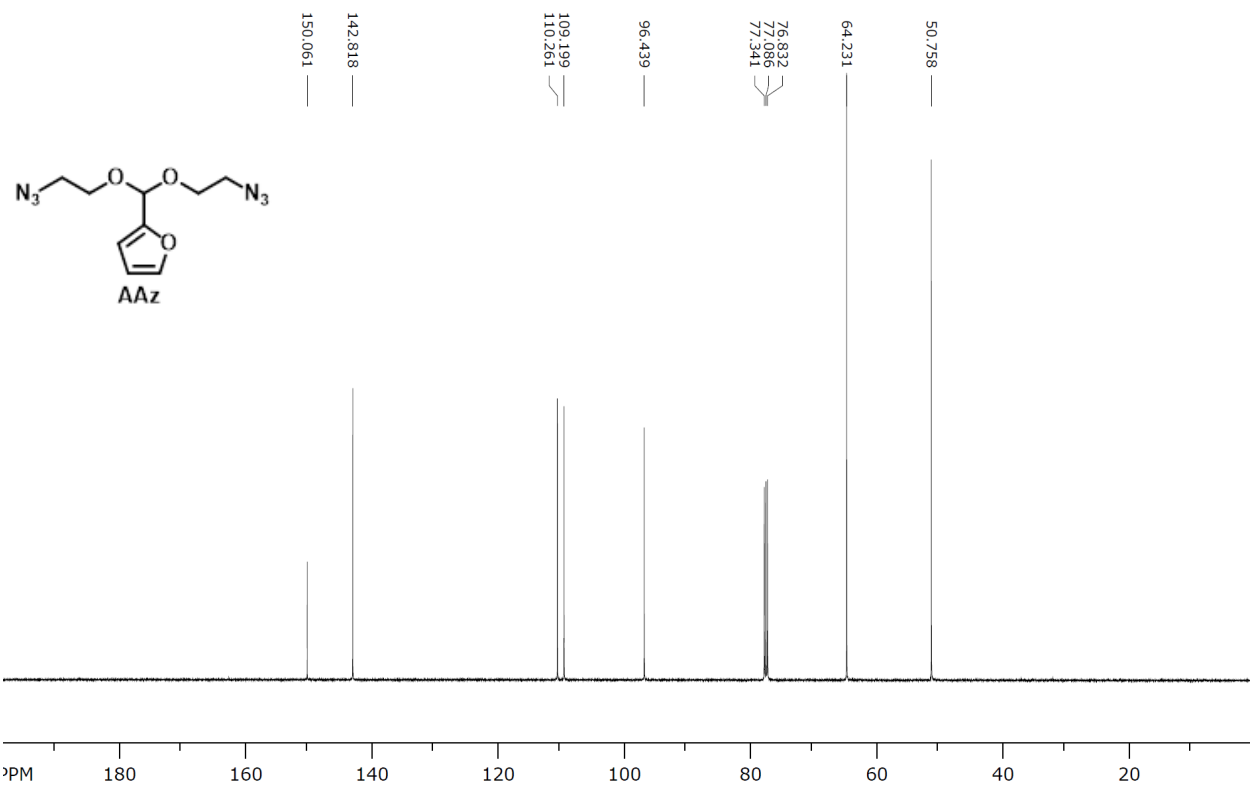
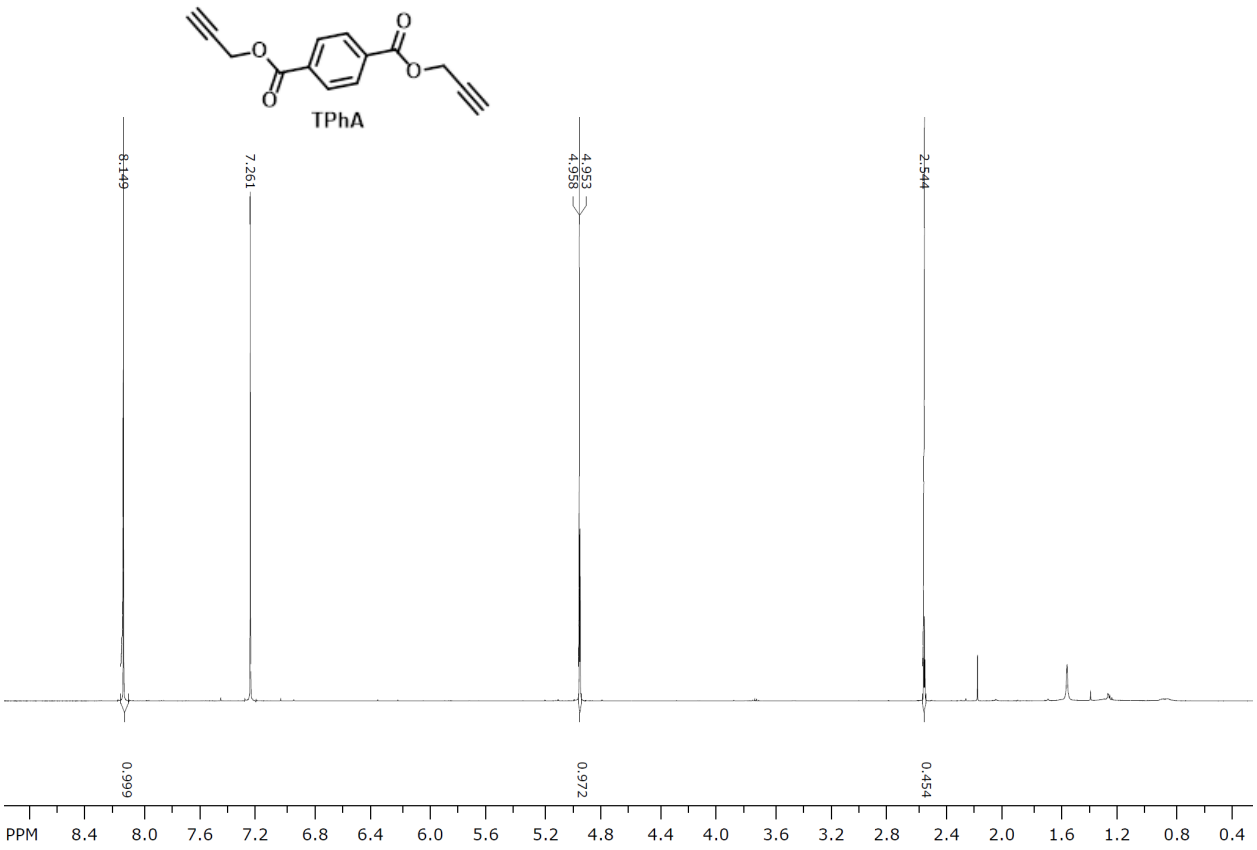
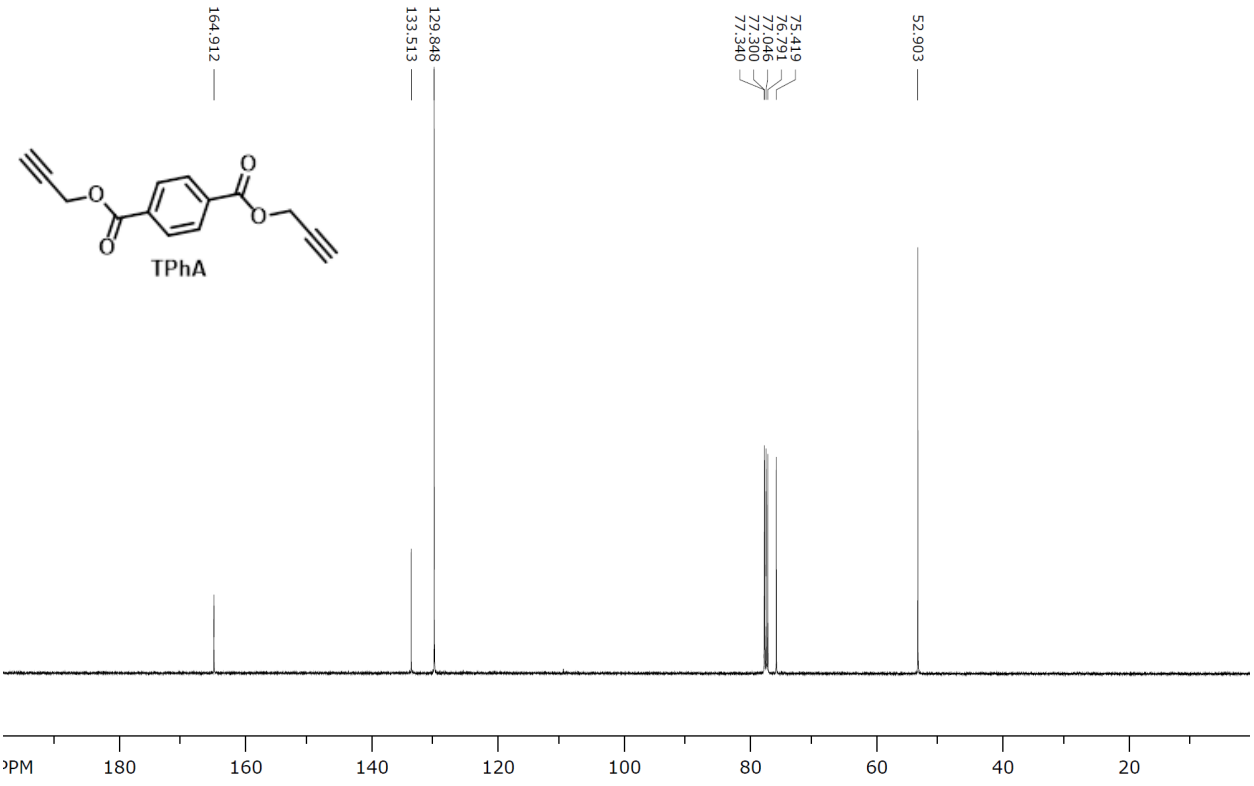

0.8
0.6
0.4
0.2
0.0
-0.2
-0.4
-0.6
Heat Flow (W/g)
-8.63°C
-5.87°C(I)
-2.84°C
-50
0
50
100
150
200
250
Temperature (°C)
Exo Up

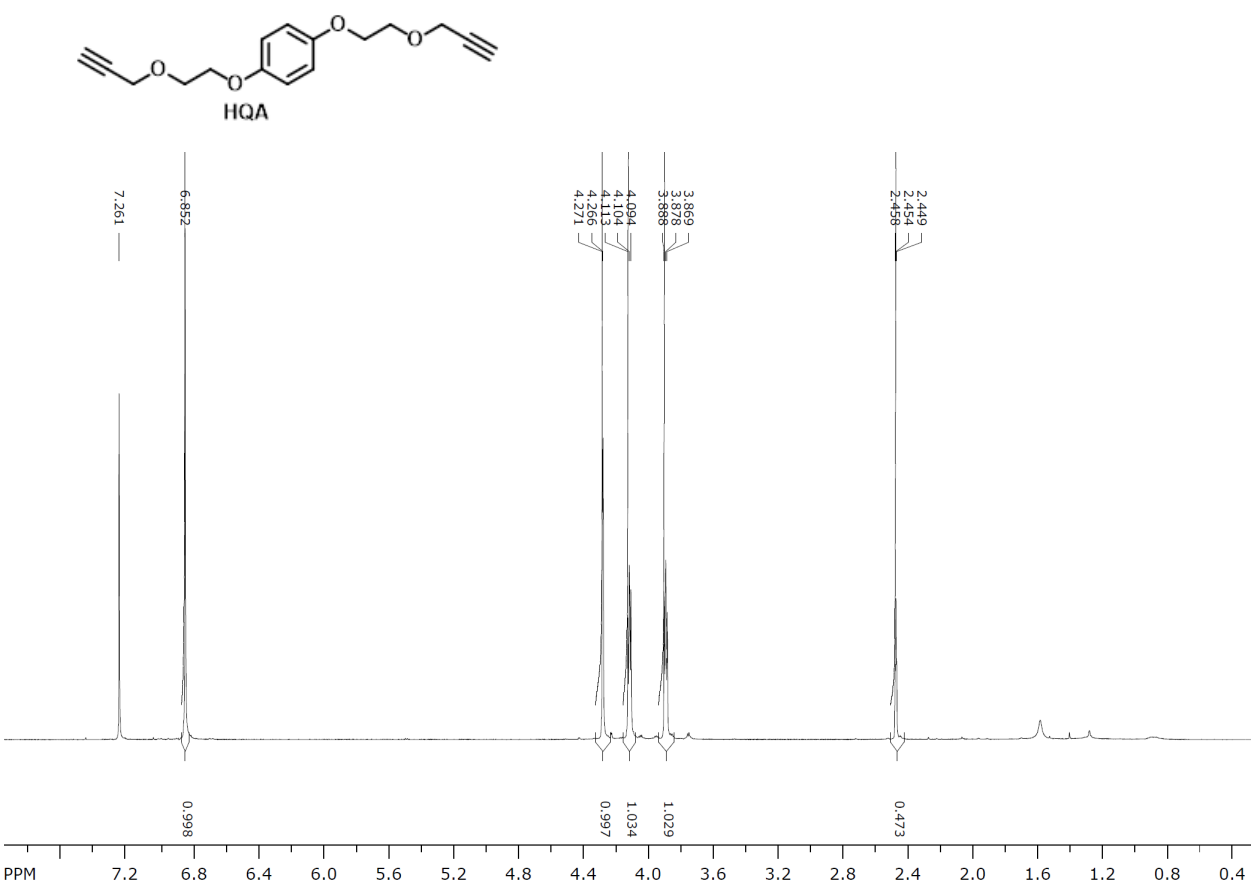
Figure S4. ^{1}H NMR spectra of monomers (500 MHz, $CDCl_3$, 298 K).

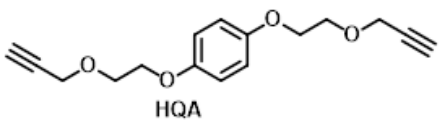



150.061
142.818
109.199
110.261
96.439
76.832
77.086
77.341
64.231
50.758
N3
O
O
O
N3
AAz
PPM
180
160
140
120
100
80
60
40
20


TPhA
8.149
7.261
4.953
4.958
2.544
0.999
0.972
0.454
PPM
8.4
8.0
7.6
7.2
6.8
6.4
6.0
5.6
5.2
4.8
4.4
4.0
3.6
3.2
2.8
2.4
2.0
1.6
1.2
0.8
0.4


164.912
133.513
129.848
77.340
77.300
77.046
76.791
75.419
52.903
TPhA
PPM
180
160
140
120
100
80
60
40
20


HQA
7.261
6.852
4.271
4.266
4.113
4.104
4.094
3.888
3.878
3.869
2.458
2.454
2.449
0.998
0.997
1.034
1.029
0.473
PPM
7.2
6.8
6.4
6.0
5.6
5.2
4.8
4.4
4.0
3.6
3.2
2.8
2.4
2.0
1.6
1.2
0.8
0.4


O
O
O
O

HQA

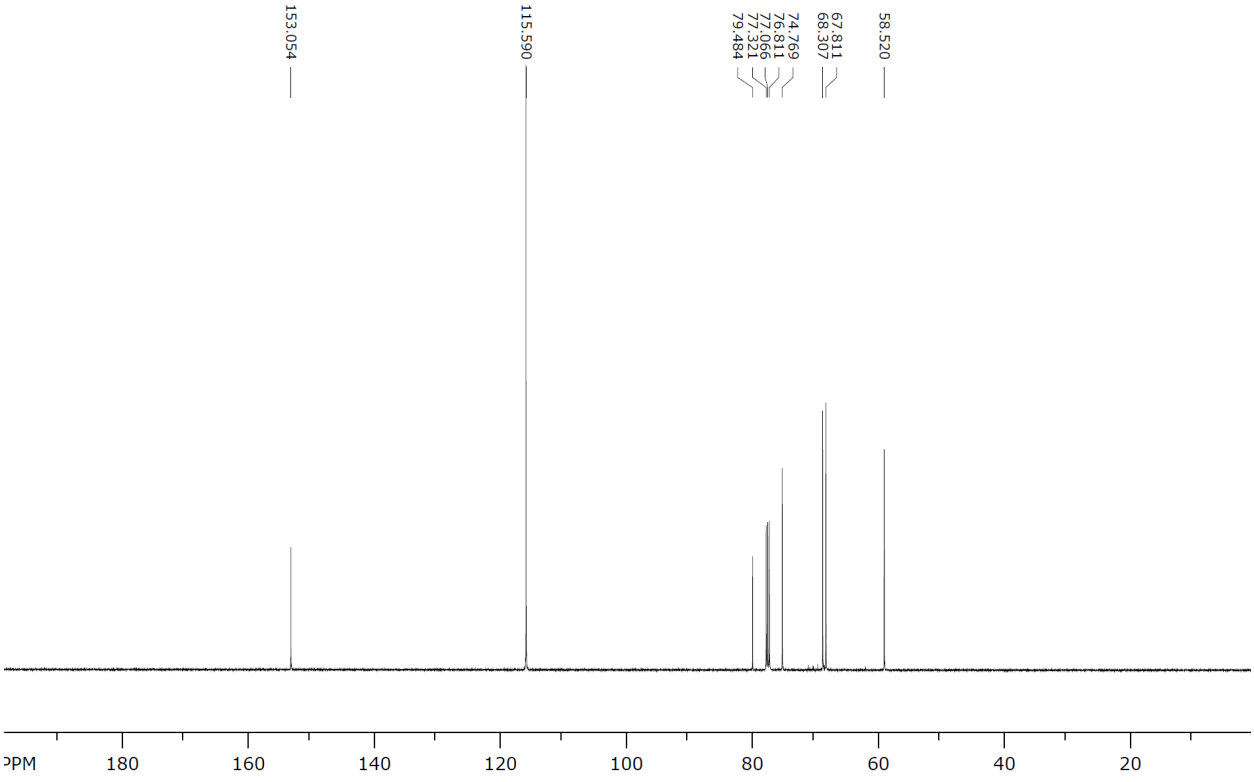
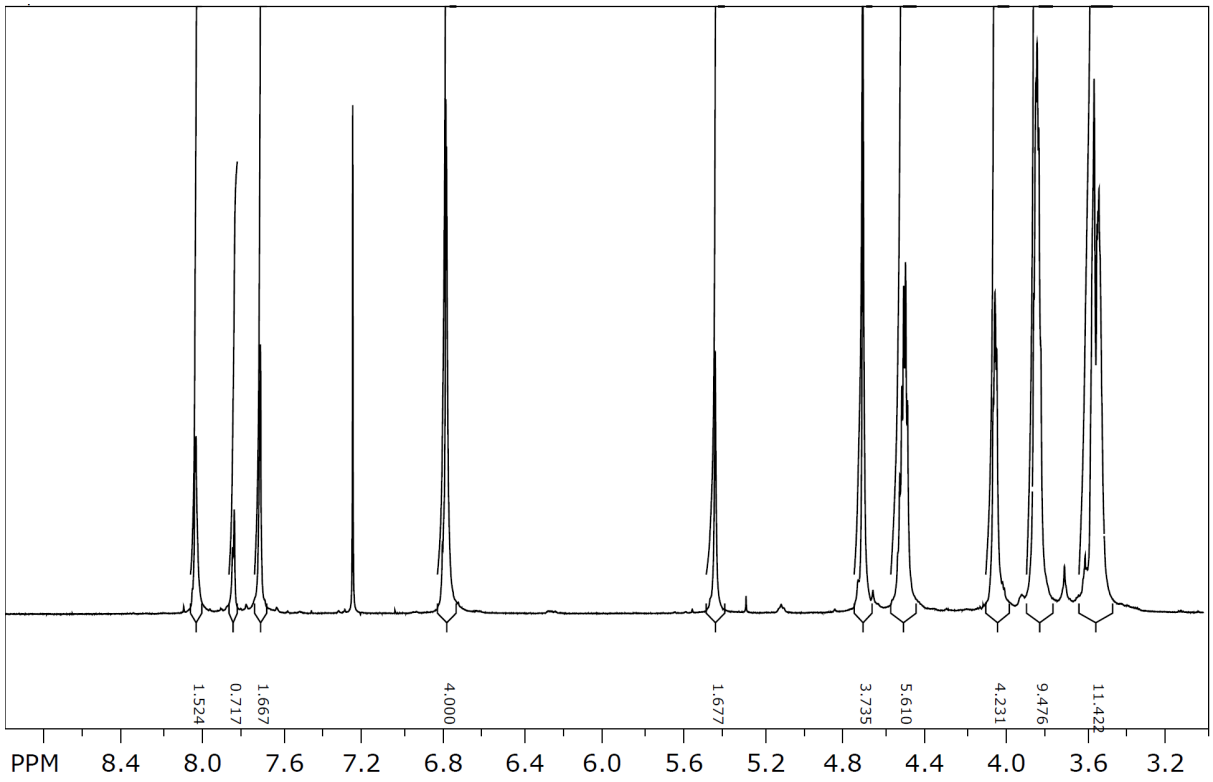
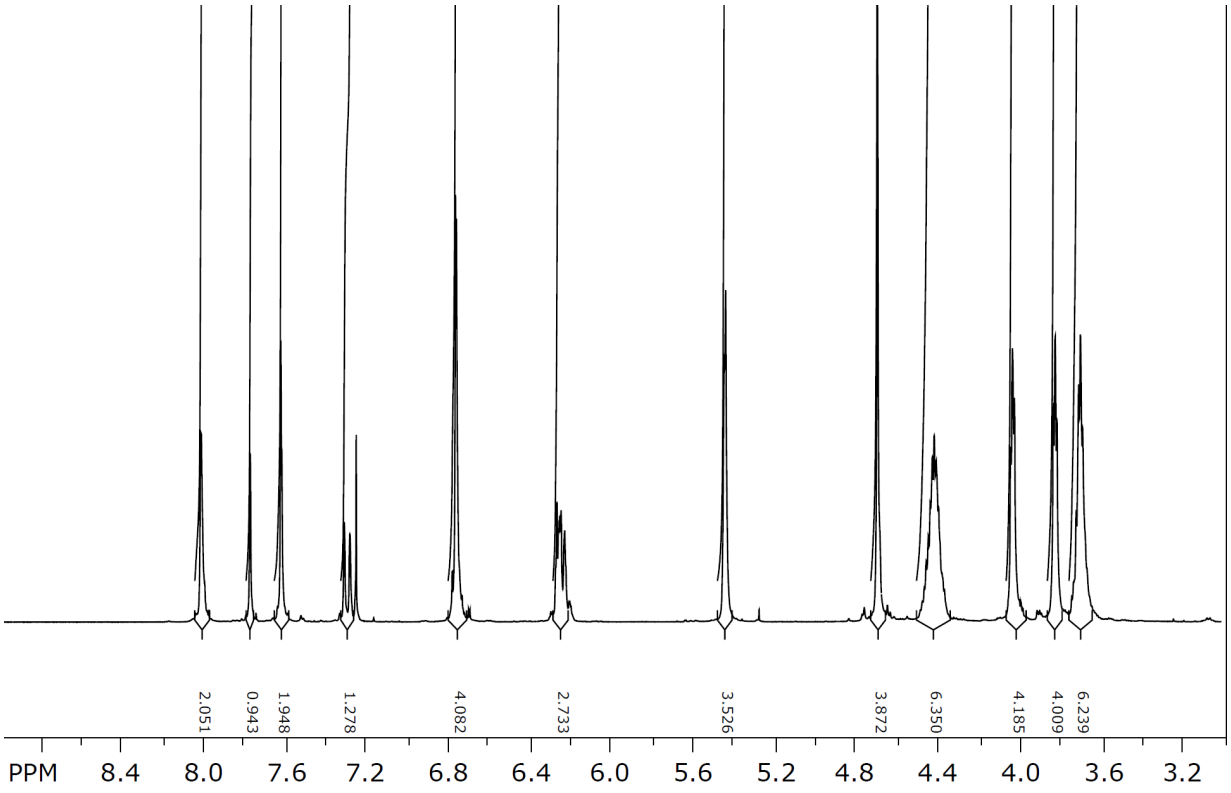

153.054
115.590
79.484
77.321
77.066
76.811
74.769
68.307
67.811
58.520
PPM
180
160
140
120
100
80
60
40
20

Figure S5 ^{1}H NMR spectra of **P1, P2, and P3**((500 MHz, $CDCl_3$, 298 K).

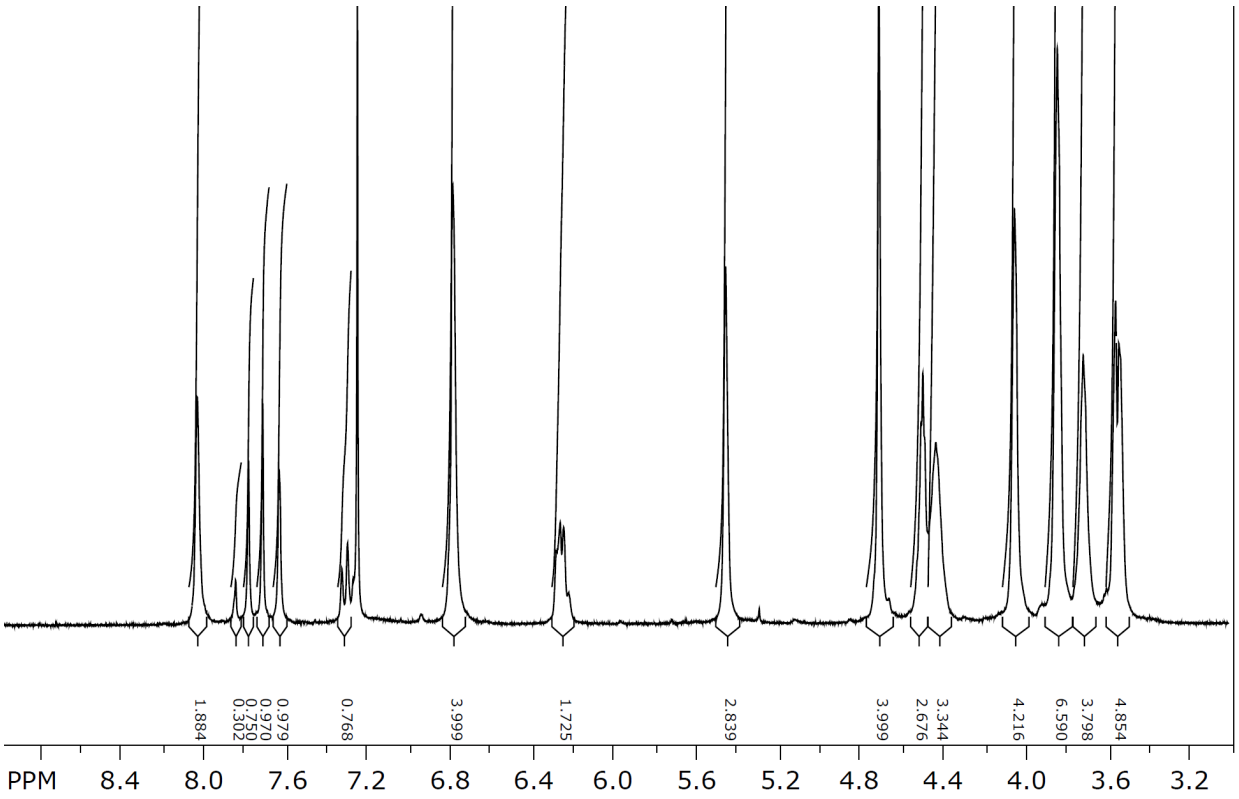
P1



P2


2.051
0.943
1.948
1.278
4.082
2.733
3.526
3.872
6.350
4.185
4.009
6.239
PPM
8.4
8.0
7.6
7.2
6.8
6.4
6.0
5.6
5.2
4.8
4.4
4.0
3.6
3.2

P3


1.884
0.302
0.750
0.970
0.979
0.768
3.999
1.725
2.839
3.999
2.676
3.344
4.216
6.590
3.798
4.854
PPM
8.4
8.0
7.6
7.2
6.8
6.4
6.0
5.6
5.2
4.8
4.4
4.0
3.6
3.2