Electronic Supplementary Material (ESI) for RSC Advances.

Selective removal of isoquinoline and quinoline from simulated fuel using 1,1'-binaphthyl-2,2'-diol (BINOL): Crystal structure and evaluation of the adduct electronic properties

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Supplementary data

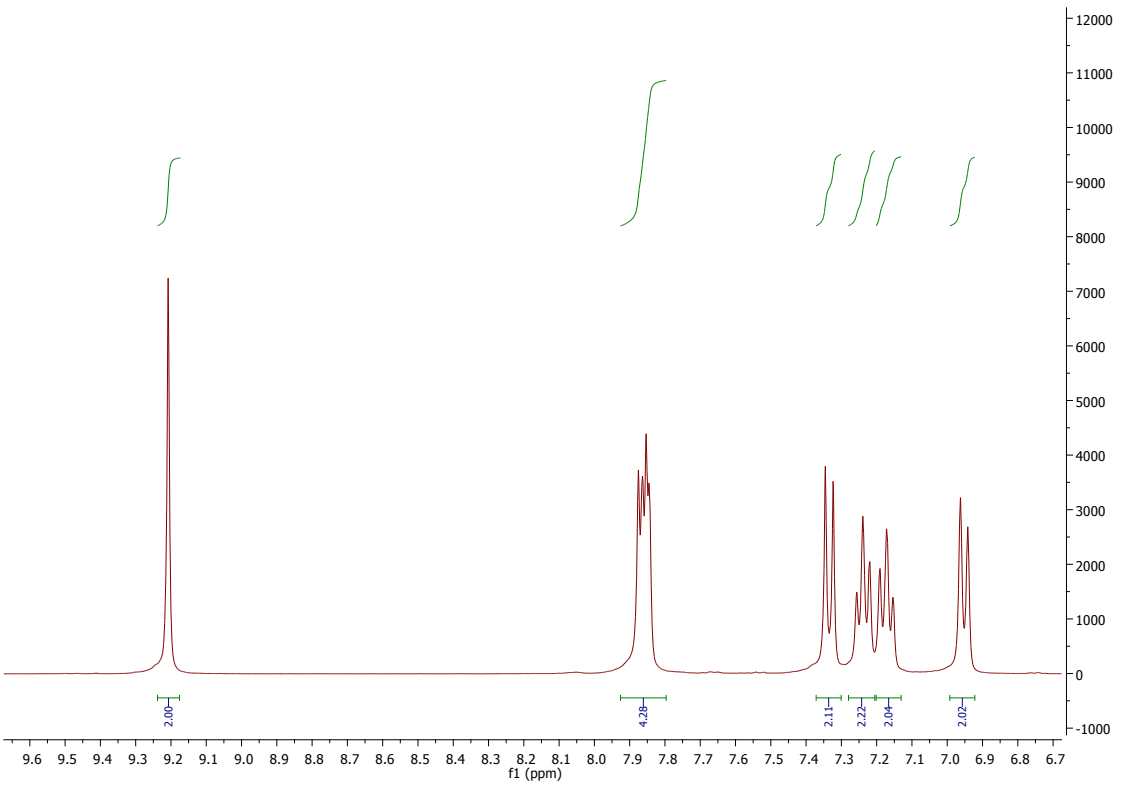


Fig. S1. 1H-NMR spectra of 1,1'-binaphthyl-2,2'-diol.

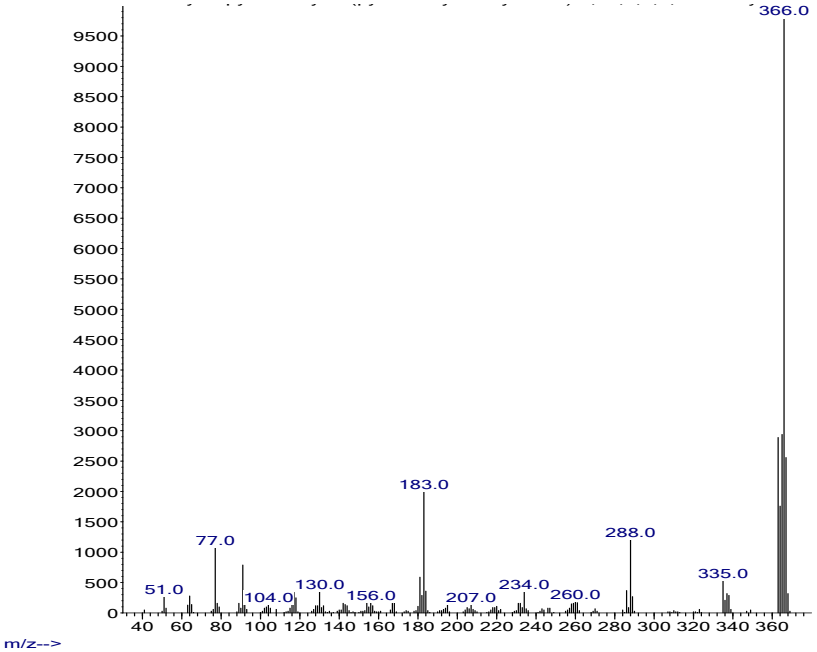


Fig. S2 GC-MS fragmentation pattern of 6-bromo-1,1'-binaphthyl-2,2'-diol.

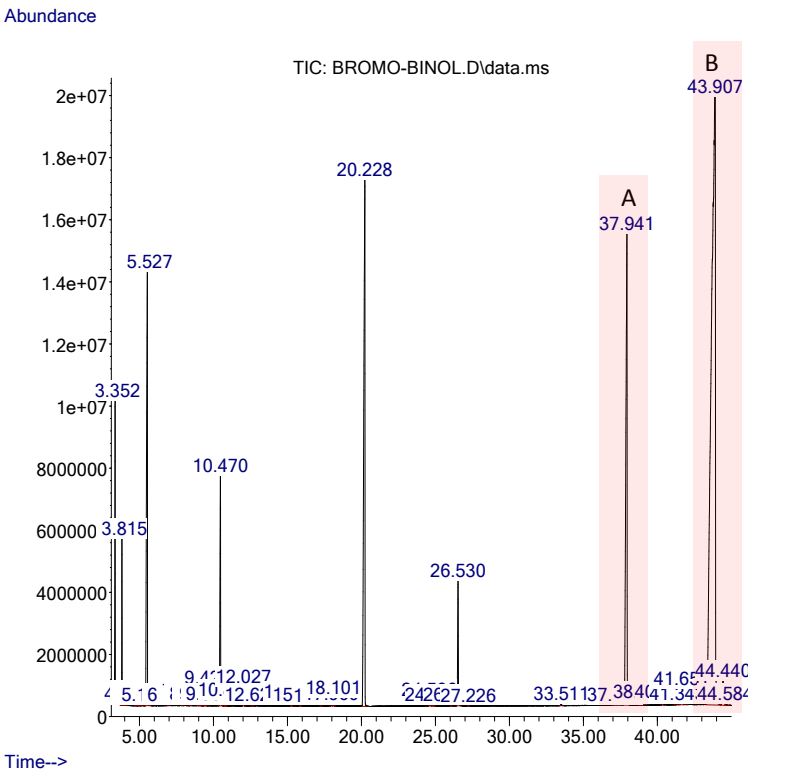
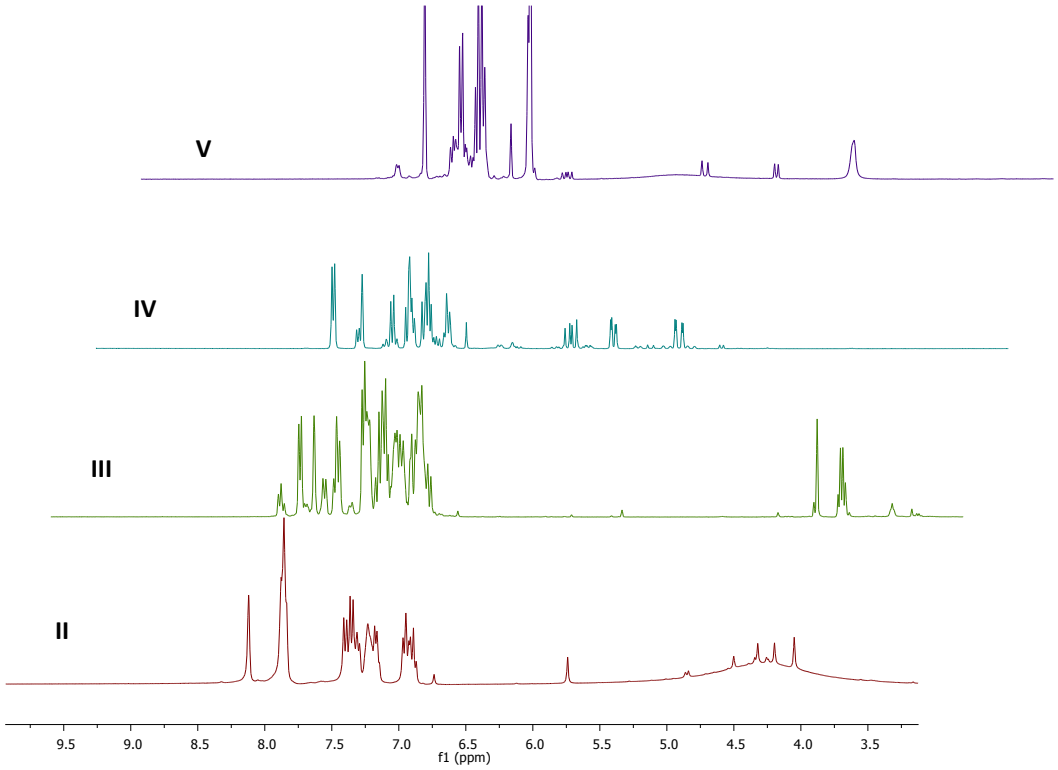
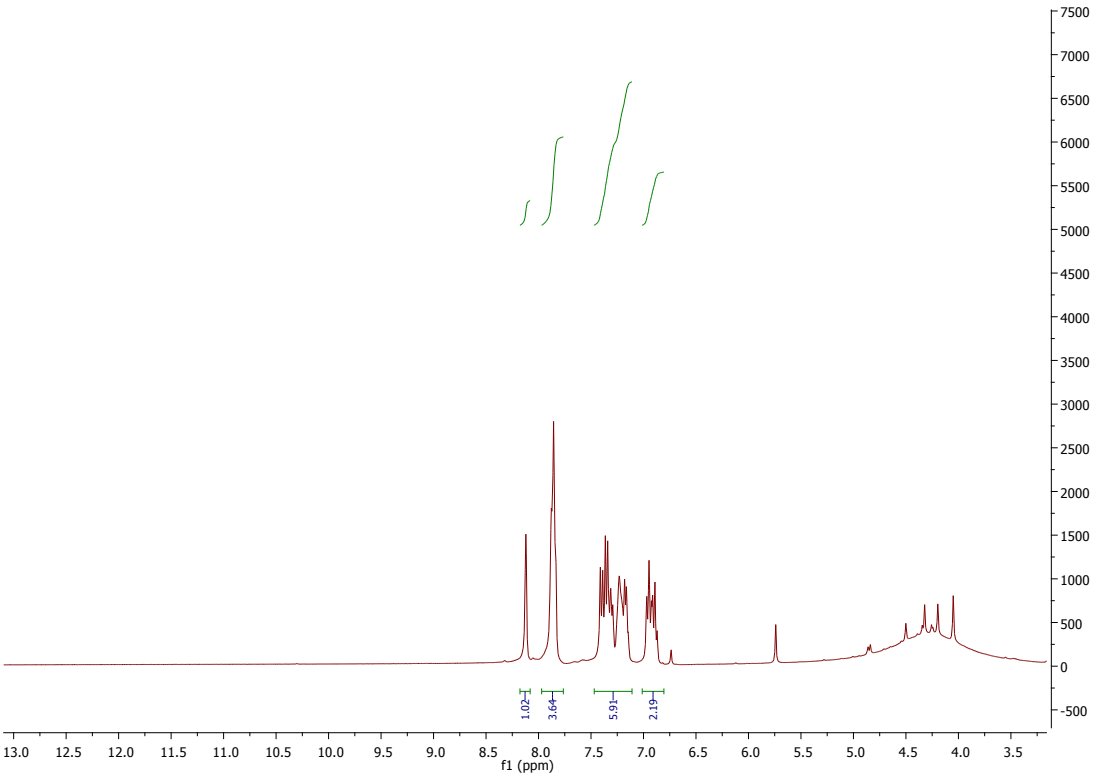


Fig. S3 GC-MS chromatogrm of (A) 1,1'-binaphthyl-2,2'-diol (8.3%) and (B) 6-bromo-1,1'-binaphthyl-2,2'-diol. The observed retention time @ 20.228 min indicate 1-bromo-2-Naphthalenol (13.2%).


V
IV
III
II
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
f1 (ppm)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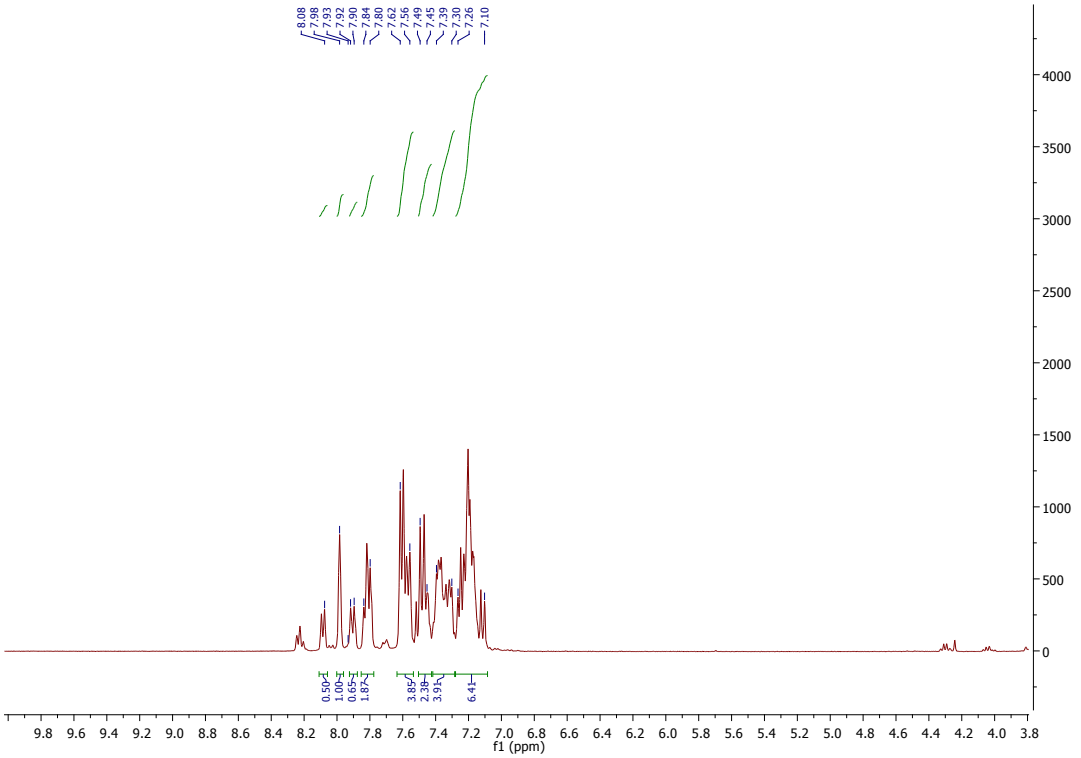
7000
6500
6000
5500
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
0
-500
1.02
3.64
5.91
2.19
13.0
12.5
12.0
11.5
11.0
10.5
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
f1 (ppm)

II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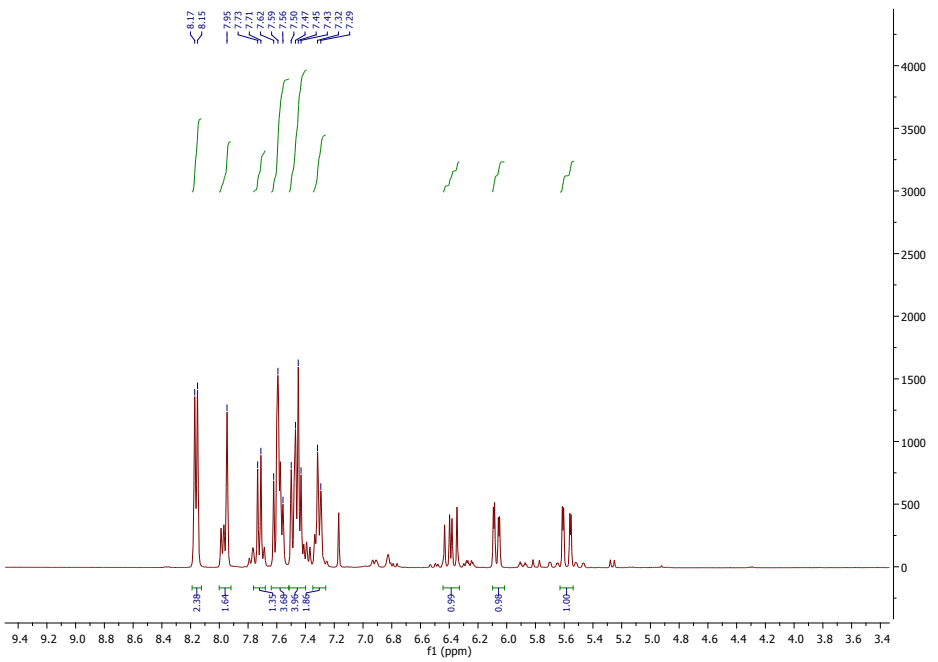
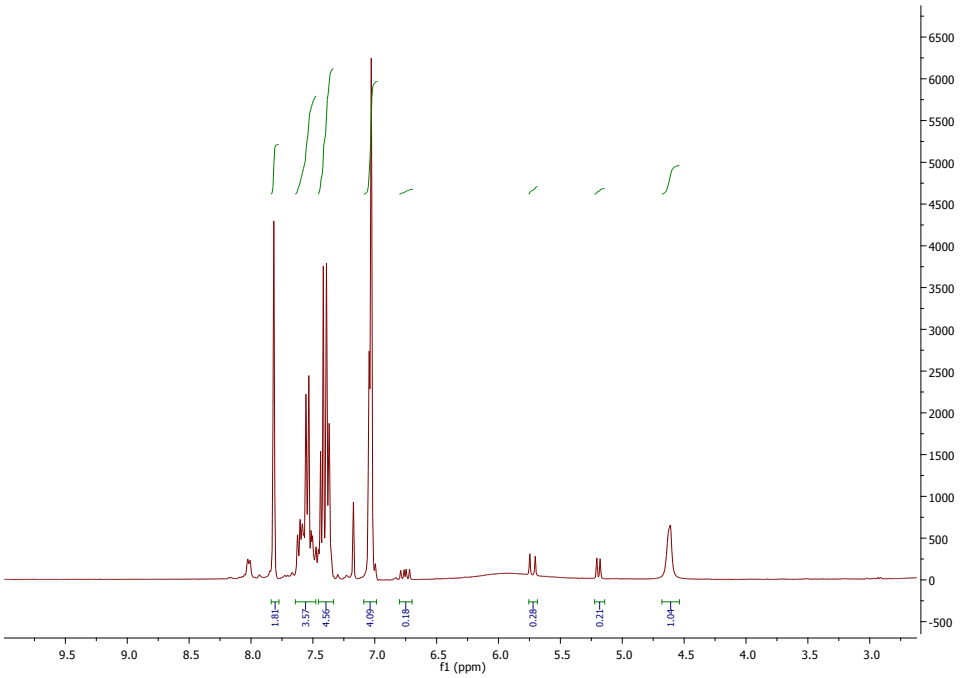
7.98
7.93
7.92
7.90
7.84
7.80
7.62
7.55
7.49
7.45
7.39
7.30
7.26
7.10
0.50
1.00
0.65
1.87
3.89
2.38
3.91
6.41
f1 (ppm)

III


8.17
8.15
7.95
7.73
7.71
7.68
7.59
7.56
7.50
7.47
7.45
7.43
7.32
7.29
2.38
1.64
1.35
3.68
3.96
1.86
0.99
0.98
1.00
f1 (ppm)

IV



V

Fig. S4. 1H-NMR spectra of 6-bromo-1,1'-binaphthyl-2,2'-diol (**II**); 6-bromo-1,1'-binaphthyl-2,2'-diyl dibenzoate (**III**); 6-vinyl-1,1'-binaphthyl-2,2'-diyl dibenzoate (**IV**) and 6-vinyl-1,1'-binaphthyl-2,2'-diol (**V**).

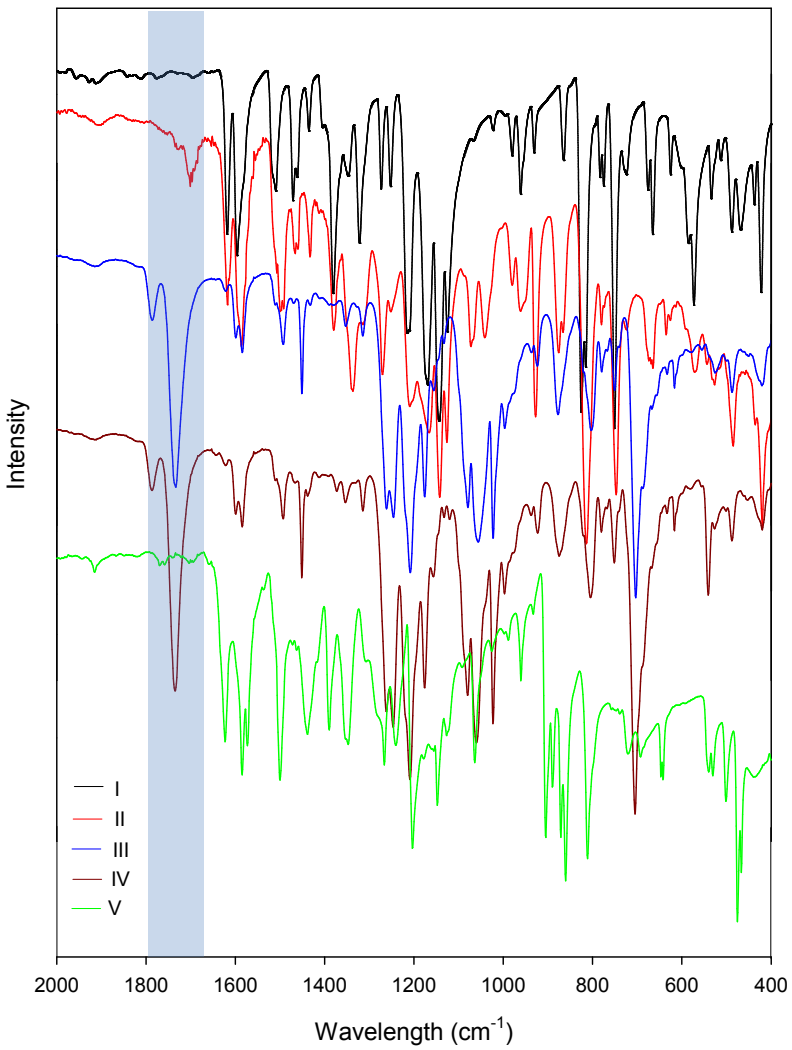


Fig. S5 FT-IR spectra of (**I**) 1,1'-binaphthyl-2,2'-diol; (**II**) 6-bromo-1,1'-binaphthyl-2,2'-diol; (**III**) 6-bromo-1,1'-binaphthyl-2,2'-diyl dibenzoate; (**IV**) 6-vinyl-1,1'-binaphthyl-2,2'-diyl dibenzoate and (**V**) 6-vinyl-1,1'-binaphthyl-2,2'-diol.

TG profile

The TG profile of 1,1'-binaphthyl-2,2'-diol (BINOL) shows a one-step degradation pattern (Fig. S6), a rapid decomposition of the BINOL (100 wt% loss) occurred at a temperature range of 200-245°C. The DSC displayed a complementary endotherms at T=220°C.

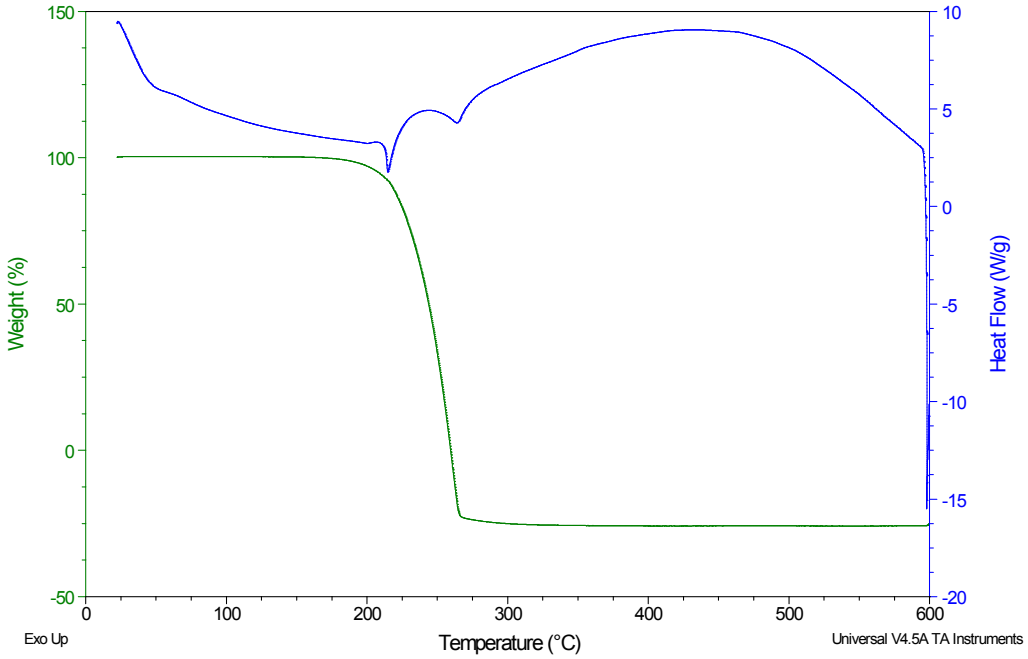


Fig. S6 TG and DSC curves for 1,1'-binaphthyl-2,2'-diol (BINOL).

Energy Dispersive Spectroscopy (EDS)

Chemical characterization of [DBN-*co*-STY] nanofibers after electrospinning was explored. Energy Dispersive Spectroscopy (EDS) spectra of [DBN-*co*-STY] polymer nanofibers are presented in Fig. S7. The presence of oxygen, nitrogen and carbon was also confirmed. The elemental % distribution of carbon and oxygen as shown by the EDS analysis are 96.53% and 3.47% respectively. The EDS analysis confirmed the presence of 1,1'-binaphthyl-2,2'-diol *via* the identification of oxygen atom.

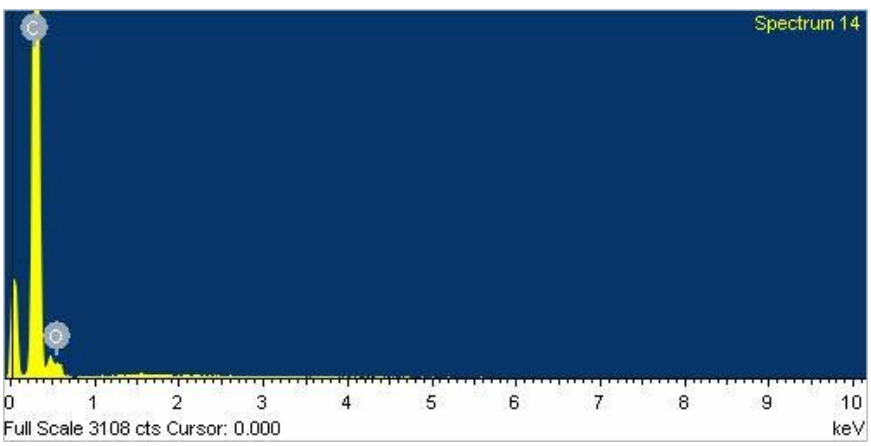


Fig. S7 EDS spectra of [DBN-*co*-STY] polymer nanofibers.

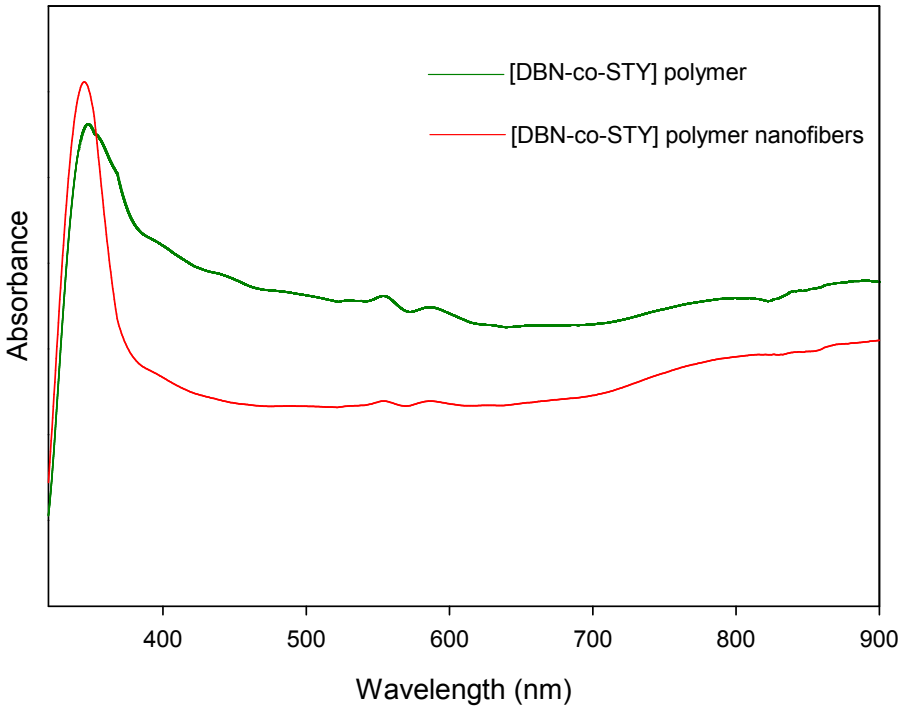


Fig. S8 UV spectra of polymer material [DBN-co-STY] and the resulting polymer nanofibers.

TG profile

The TG profile of [DBN-co-STY] polymer shows a one-step degradation pattern (Fig. S9), a rapid decomposition of the [DBN-co-STY] polymer (100 wt% loss) occurred at a temperature range of 400-440°C. The DSC displayed a complementary endotherms at T=430°C.

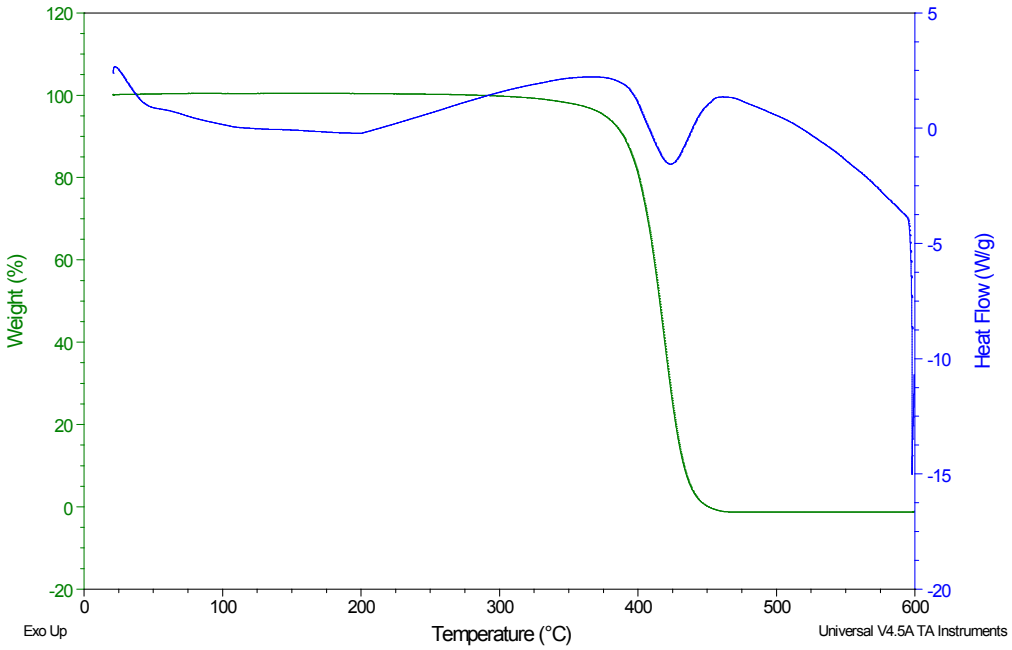


Fig. S9 TG and DSC curves for [DBN-co-STY] polymer.

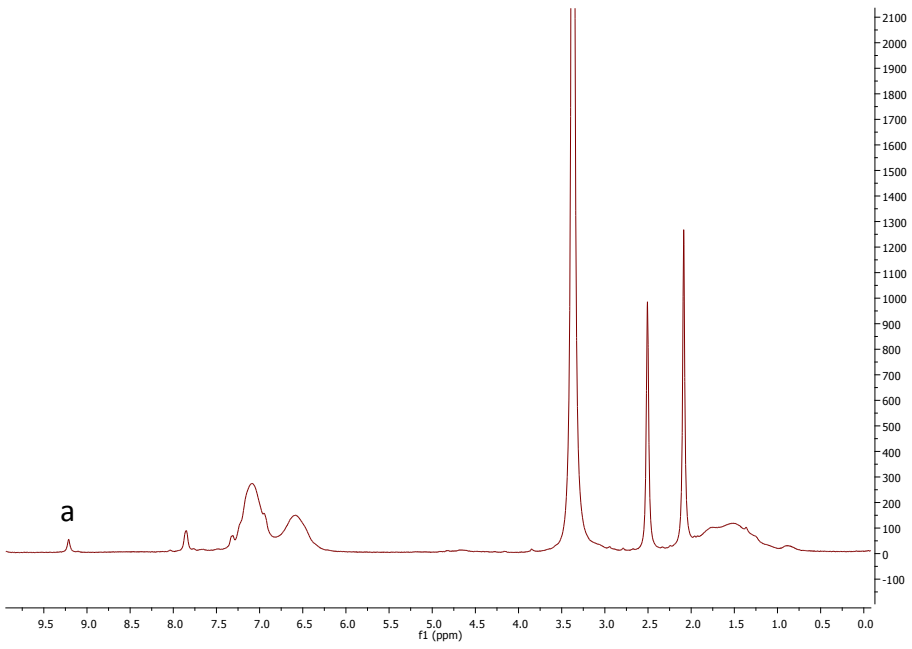


Fig. S10 ^{1}H-NMR spectra of [DBN-*co*-STY] (a: confirmed the presence of –OH).

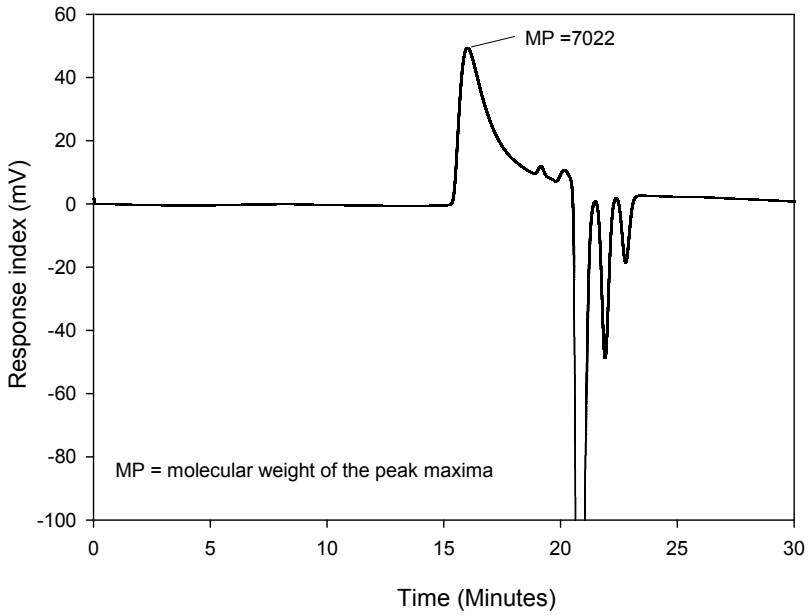


Fig. S11 Molecular weight distribution of DBN-*co*-STY as a function of time.

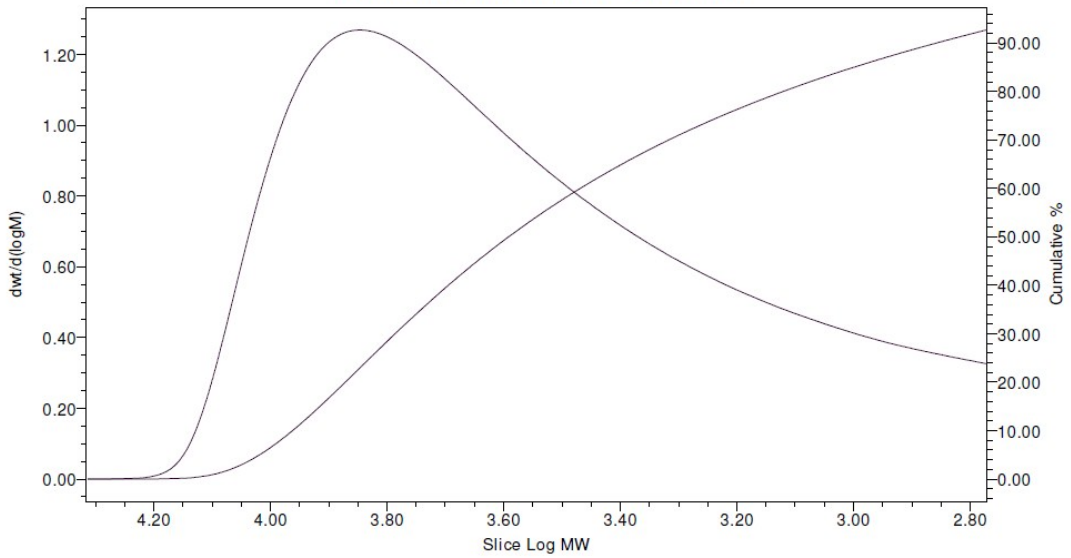


Fig. S12 The distribution plot, dw/d(logM_w) vs log M_w

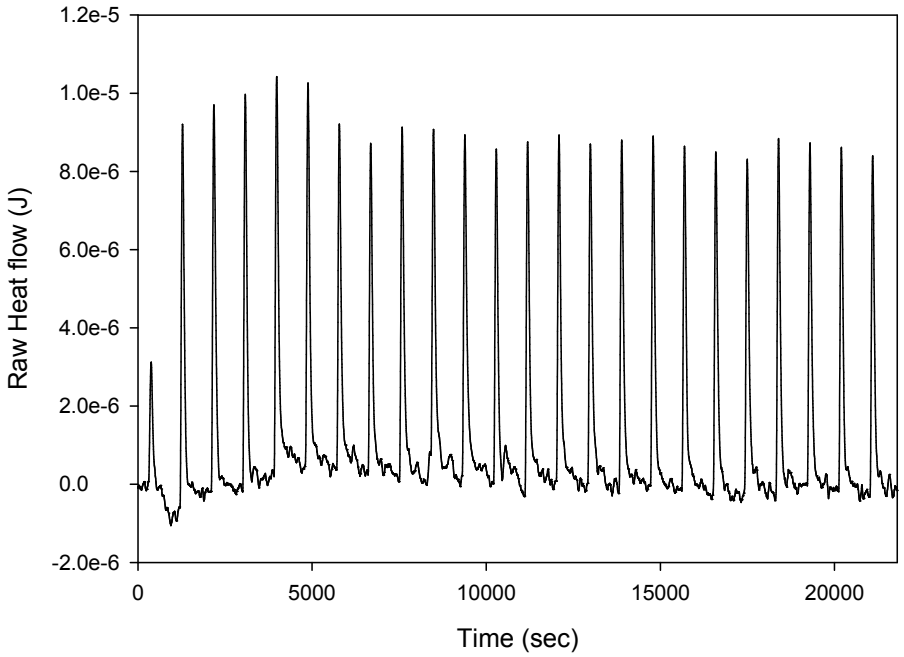


Fig. S13 ITC titration involving 1,1'-binaphthyl-2,2'-diol (BINOL) (0.998 mM) and carbazole (9.98 mM).

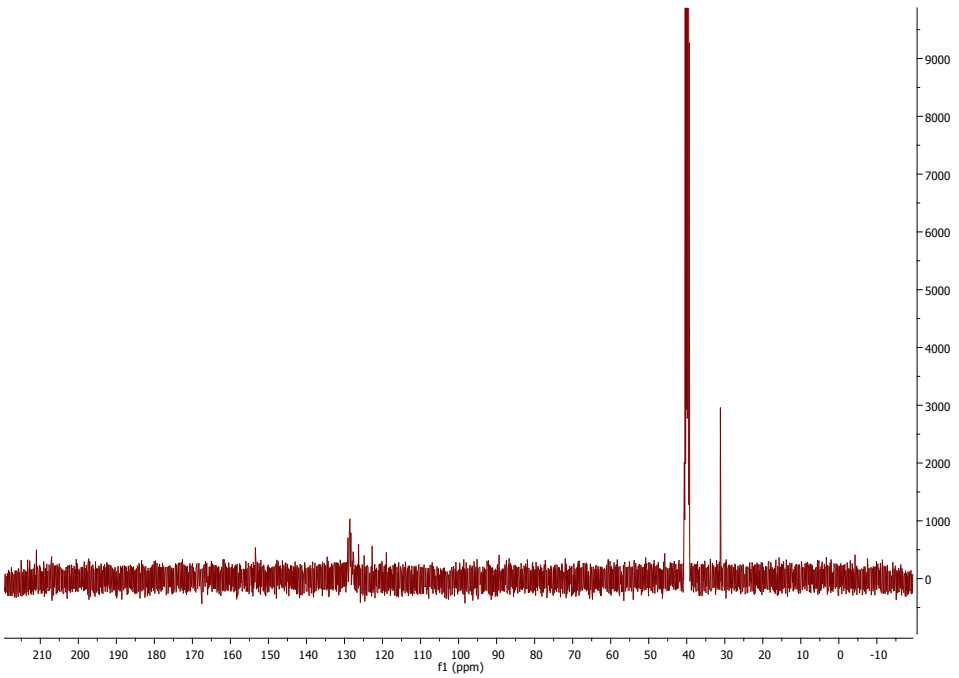


Fig S14. ^{13}C-NMR spectra of [DBN-*co*-STY].