

Supporting information

Inherent flame retardation of semi-aromatic polyesters via binding small-molecule free radicals and charring

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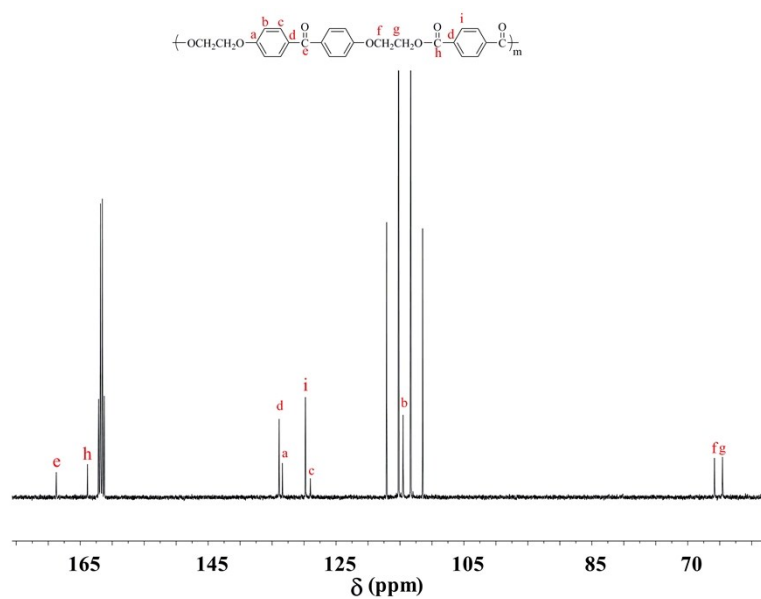
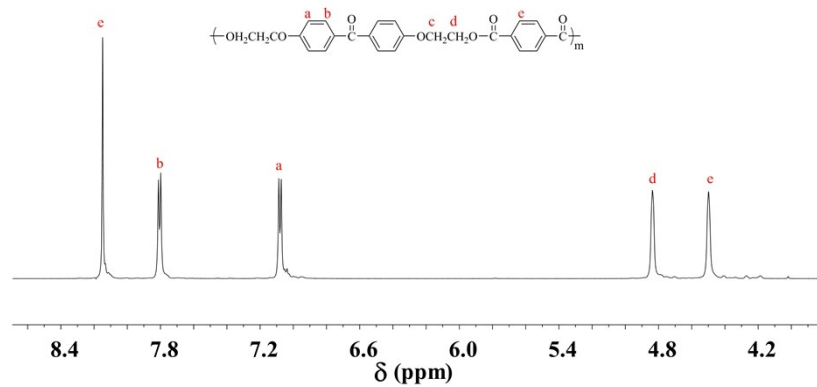
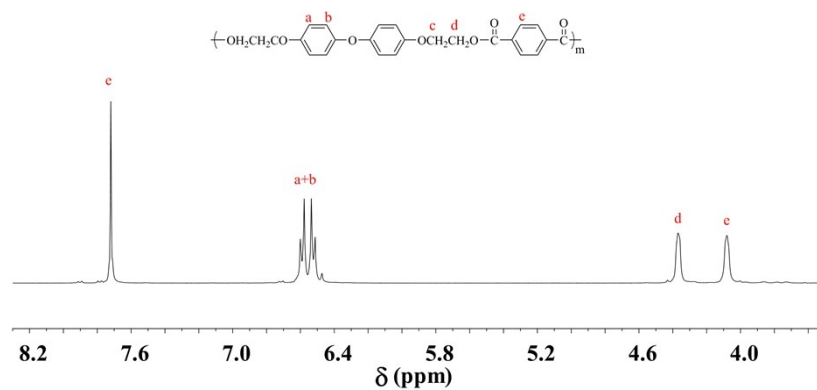


Fig. S1 $^1\text{H NMR}$ and $^{13}\text{C NMR}$ spectrum of PKT.



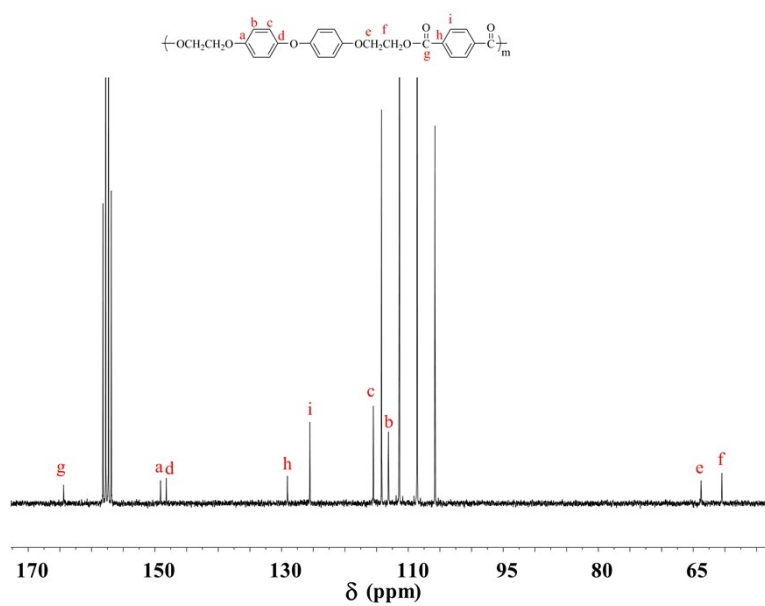


Fig. S2 ^1H NMR and ^{13}C NMR spectrum of POT.

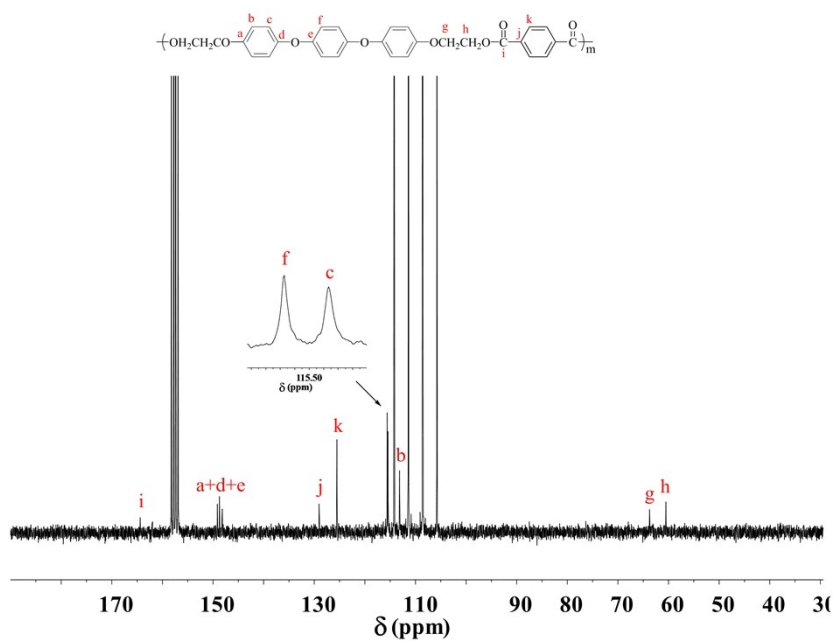
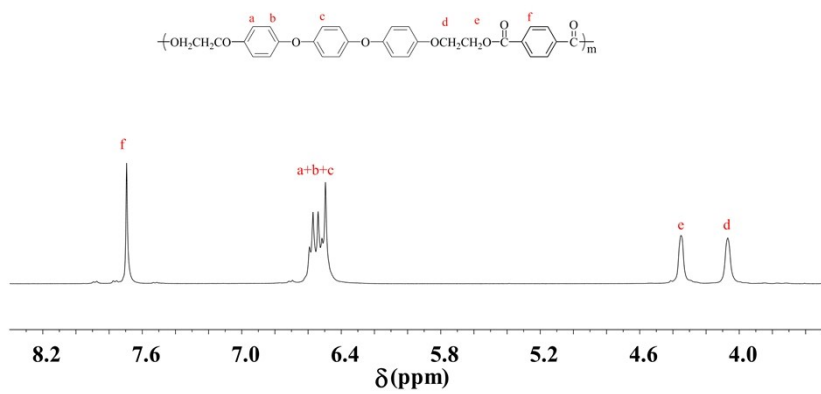


Fig. S3 ^1H NMR and ^{13}C NMR spectrum of PEET.

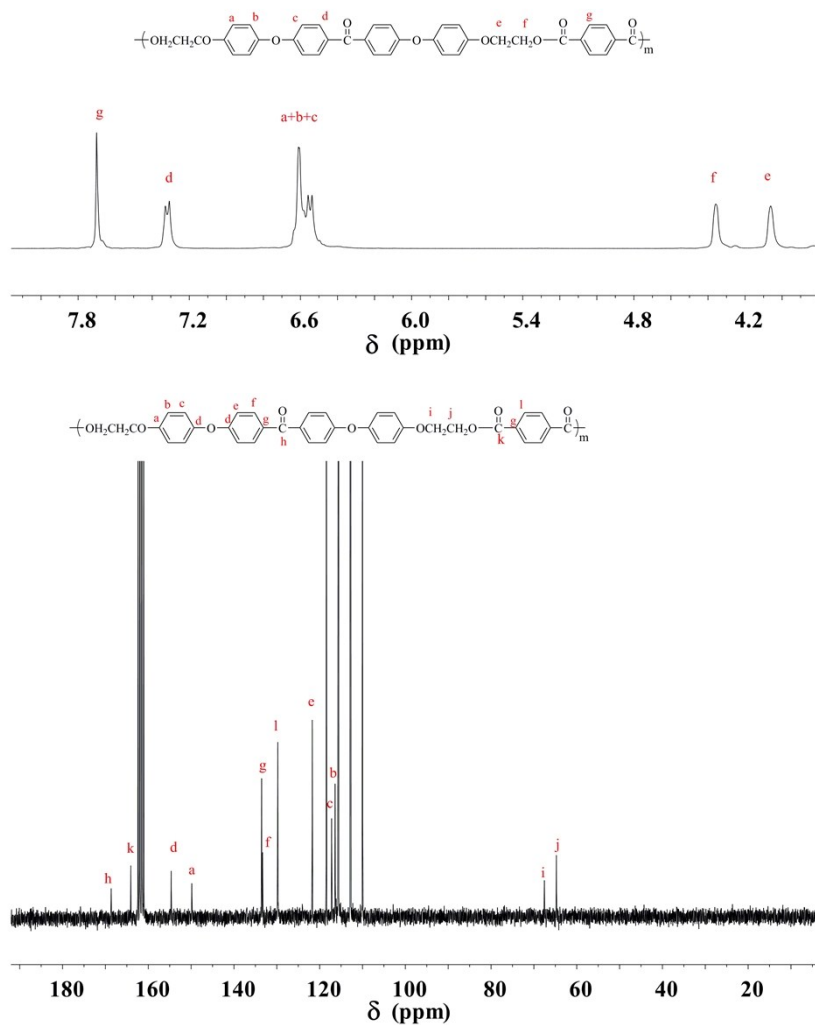


Fig. S4 ^1H NMR and ^{13}C NMR spectrum of PEKET.

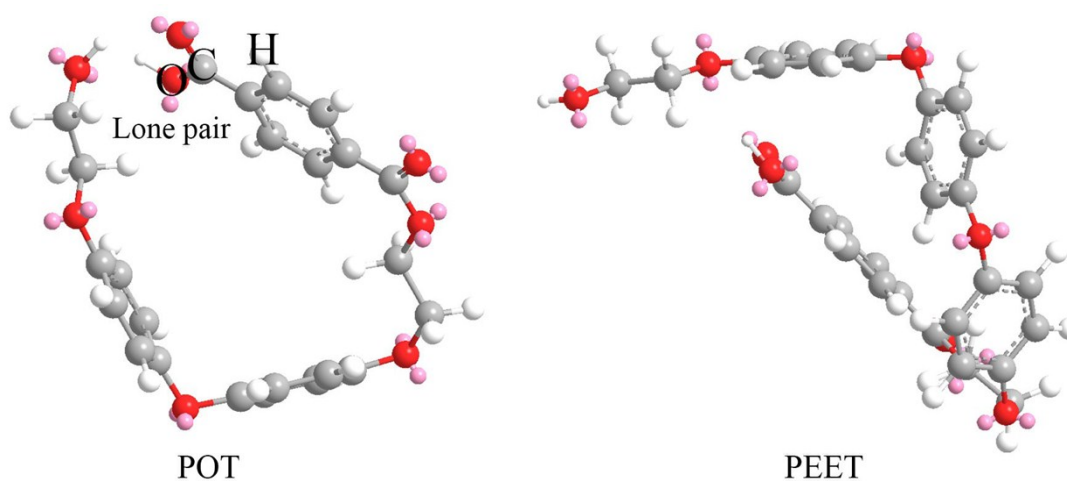


Fig. S5 3D structure for POT and PEET structure units simulated by ChemBio 3D

MM2 Minimize Energy

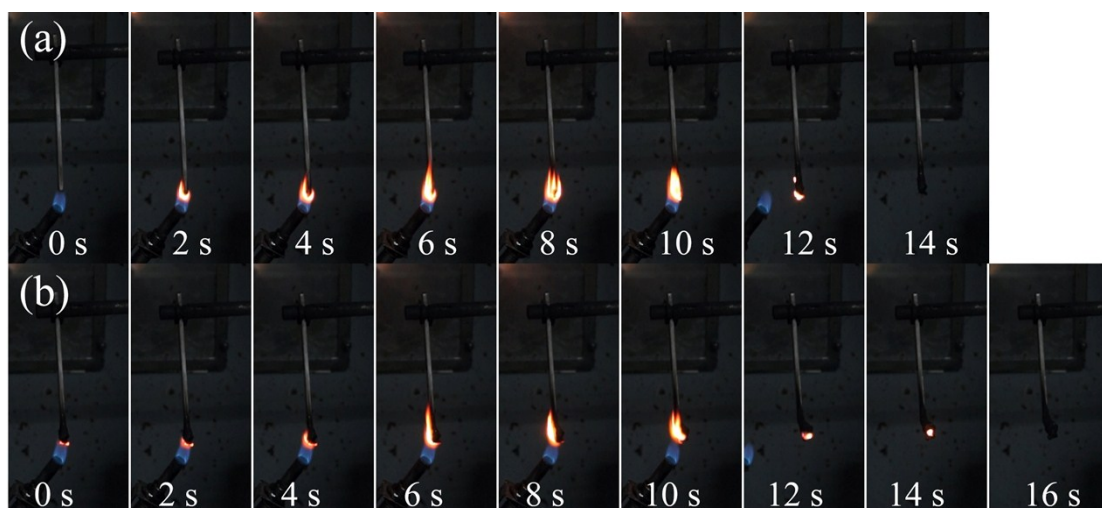
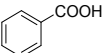
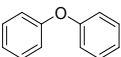
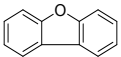
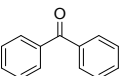
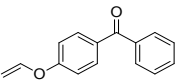
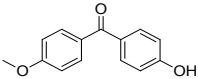
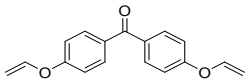
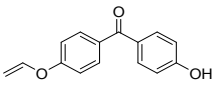
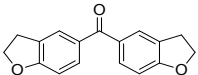
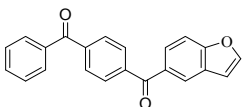
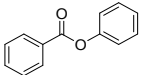
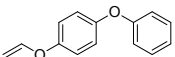
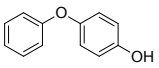
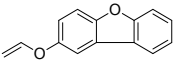
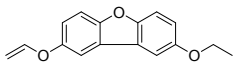
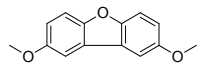
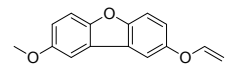
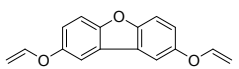
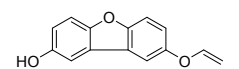
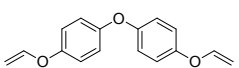
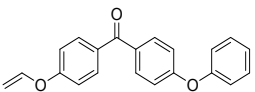
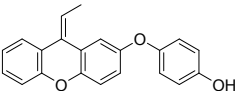
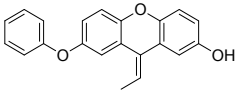
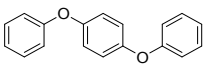
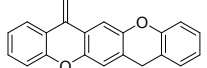
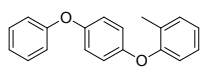


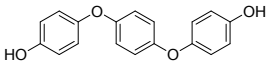
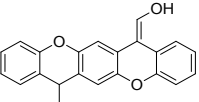
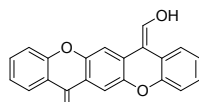
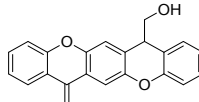
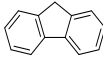
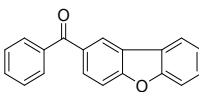
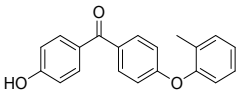
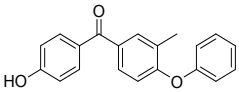
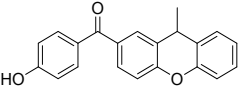
Fig. S6 UL-94 test for PEET: (a) the first ignition and (b) the second ignition.

Table S1. Peak numbers, retention time, molecular weight and major mass fragments for pyrolysis products.

Peak numbers	Retention time (min)	M	Compounds	Major mass fragments
1	1.48	92	 toluene	92, 91, 65
2	2.62	106	 ethylbenzene	106, 91, 77, 65, 51
3	3.04	104	 styrene	104, 103, 78, 77, 63, 51
4	3.64	120	 (vinylloxy)benzene	120, 94, 91, 77, 66, 65, 51
5	4.30	94	 phenol	94, 66, 65
6	5.25	120	 acetophenone	120, 105, 77, 51
7	5.55	136	 methyl benzoate	136, 105, 77, 51
8	5.99	148	 4-(vinylloxy)benzaldehyde	148, 105, 77, 51

9	6.70	122	 benzoic acid	122, 105, 77, 51
10	8.34	154	 1,1'-biphenyl	155, 154, 153, 152, 151, 150, 77, 76
11	8.52	170	 oxydibenzene	170, 168, 142, 141, 115, 77, 51
12	9.51	168	 dibenzo[b,d]furan	168, 139, 70, 51
13	10.39	182	 benzophenone	182, 105, 77, 51
14	12.46	224	 phenyl(4-(vinylloxy)phenyl)methanone	224, 181, 147, 121, 105, 91, 77, 65
15	13.92	228	 (4-hydroxyphenyl)(4-methoxyphenyl)methanone	227, 105, 77, 51
16	14.27	266	 bis(4-(vinylloxy)phenyl)methanone	266, 223, 147, 121, 91
17	14.88	240	 (4-hydroxyphenyl)(4-(vinylloxy)phenyl)methanone	241, 240, 197, 147, 121, 93, 91, 65
18	15.53	266	 bis(2,3-dihydrobenzofuran-5-yl)methanone	266, 223, 147, 119, 91, 65
19	18.58	326	 (4-(benzofuran-5-carbonyl)phenyl)(phenyl)methanone	326, 105, 77, 51
20	10.59	198	 phenyl benzoate	198, 105, 77, 51
21	10.69	212	 1-phenoxy-4-(vinylloxy)benzene	212, 183, 129, 91, 77
22	11.18	186	 4-phenoxyphenol	186, 158, 129, 77

23	11.39	210	 2-(vinylloxy)dibenzo[b,d]furan	210, 182, 181, 154, 153, 152, 77
24	12.56	254	 2-ethoxy-8-(vinylloxy)dibenzo[b,d]furan	254, 225, 119, 91, 65
25	13.01	228	 2,8-dimethoxydibenzo[b,d]furan	228, 199, 91, 65
26	13.07	240	 2-methoxy-8-(vinylloxy)dibenzo[b,d]furan	240, 228, 211, 210, 183, 119, 91, 77
27	13.22	252	 2,8-bis(vinylloxy)dibenzo[b,d]furan	252, 223, 195, 169, 141, 91, 89
28	13.71	226	 8-(vinylloxy)dibenzo[b,d]furan-2-ol	226, 197, 169
29	13.79	254	 4,4'-oxybis((vinylloxy)benzene)	254, 91, 65
30	15.74	316	 (4-phenoxyphenyl)(4-(vinylloxy)phenyl)methanone	315, 285, 284, 283, 105, 77
31	17.17	316	 (Z)-4-((9-ethylidene-9H-xanthen-2-yl)oxy)phenol	316, 105, 77
32	17.81	316	 (Z)-9-ethylidene-7-phenoxy-9H-xanthen-2-ol	316, 105, 77
33	14.16	262	 1,4-diphenoxybenzene	262, 246, 185, 141, 115, 77
34	15.72	298	 7-methylene-7,14-dihydrochromeno[2,3-b]xanthene	298, 273, 185, 182, 141, 115, 91, 77
35	16.14	276	 1-methyl-2-(4-phenoxyphenoxy)benzene	276, 275, 185, 141, 115, 77

36	16.35	294	 4,4'-(1,4-phenylenebis(oxy))diphenol	294, 293, 181, 141, 115, 77
37	17.14	328	 (E)-(14-methylchromeno[2,3- <i>b</i>]xanthen-7(14 <i>H</i>)-ylidene)methanol	328, 183, 182, 181, 155, 154, 153
38	17.74	326	 (E)-(14-methylenechromeno[2,3- <i>b</i>]xanthen-7(14 <i>H</i>)-ylidene)methanol	326, 183, 182, 181, 155, 154, 153
39	18.25	328	 (14-methylene-7,14-dihydrochromeno[2,3- <i>b</i>]xanthen-7-yl)methanol	328, 183, 182, 181, 155, 154, 153, 91
40	10.04	166	 9 <i>H</i> -fluorene	166, 165 164, 163, 139, 115, 83
41	15.66	272	 dibenzo[<i>b,d</i>]furan-2-yl(phenyl)methanone	273, 272, 197, 141, 115, 105, 77
42	17.11	304	 (4-hydroxyphenyl)(4-(<i>o</i> -tolyloxy)phenyl)methanone	305, 304, 211, 168, 157, 105
43	17.20	304	 (4-hydroxyphenyl)(3-methyl-4-phenoxyphenyl)methanone	304, 197, 126, 72
44	17.75	316	 (4-hydroxyphenyl)(9-methyl-9 <i>H</i> -xanthen-2-yl)methanone	315, 303, 302, 239, 238, 237