Electronic Supplementary Material (ESI) for Polymer Chemistry.


**Supporting Information**

# 100% Hyperbranched Polymers via Acid-Catalyzed Friedel-Crafts Aromatic Substitution Reaction

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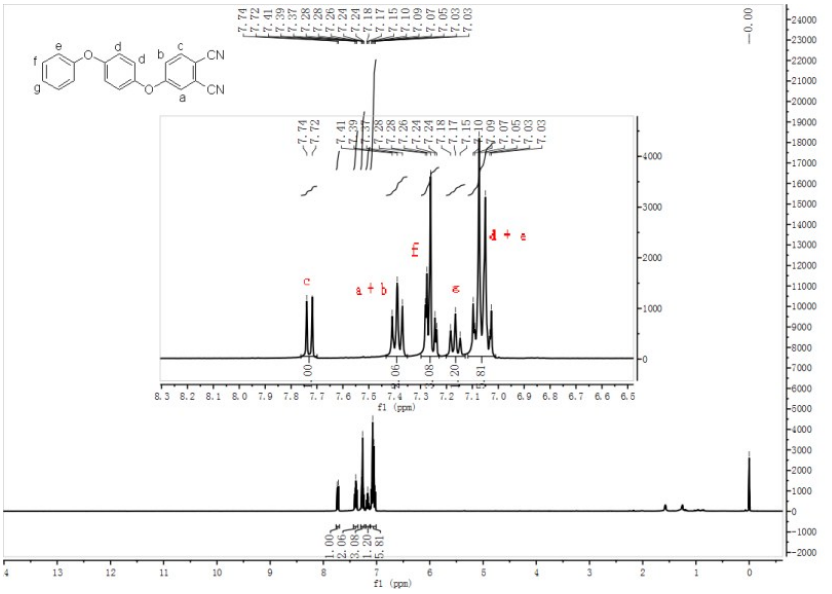
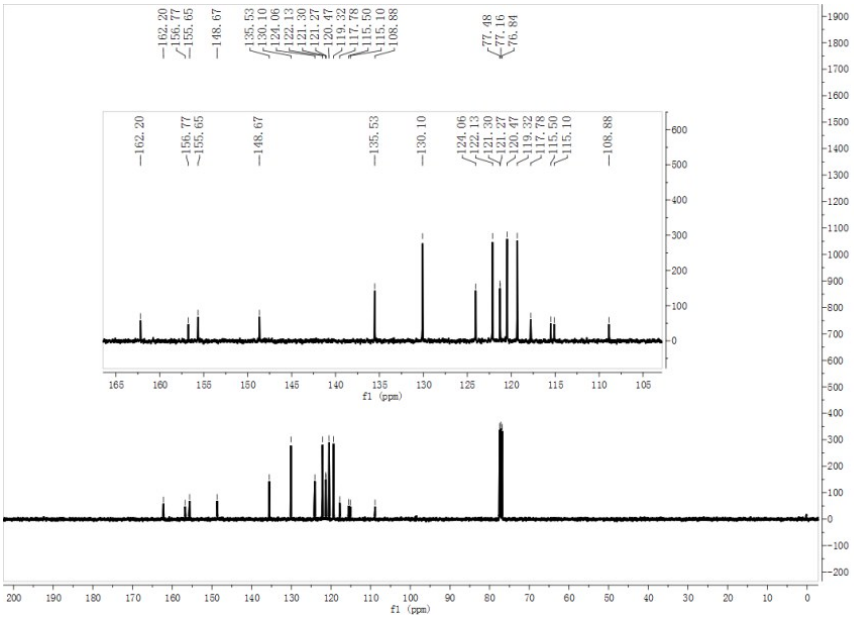




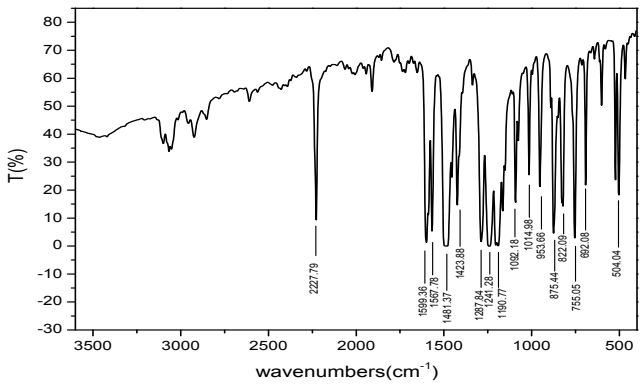
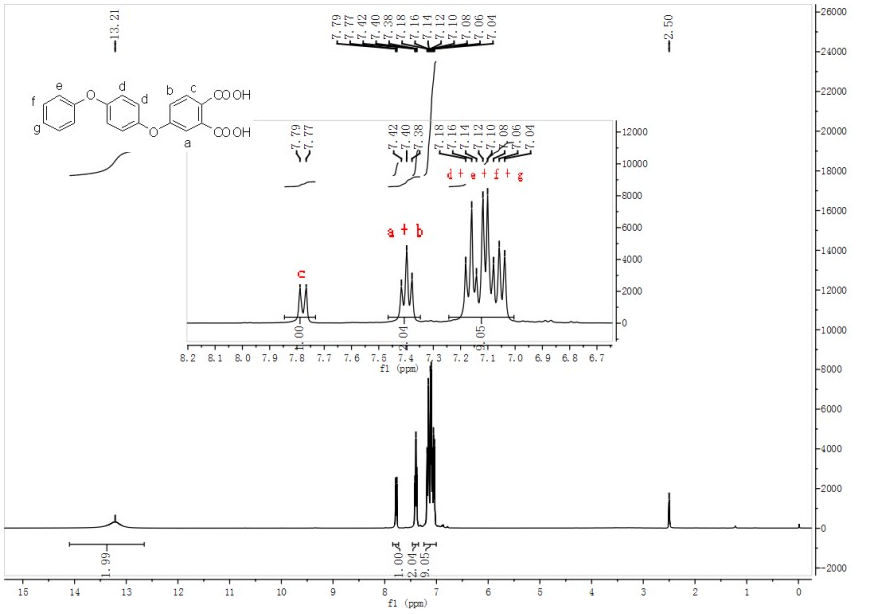
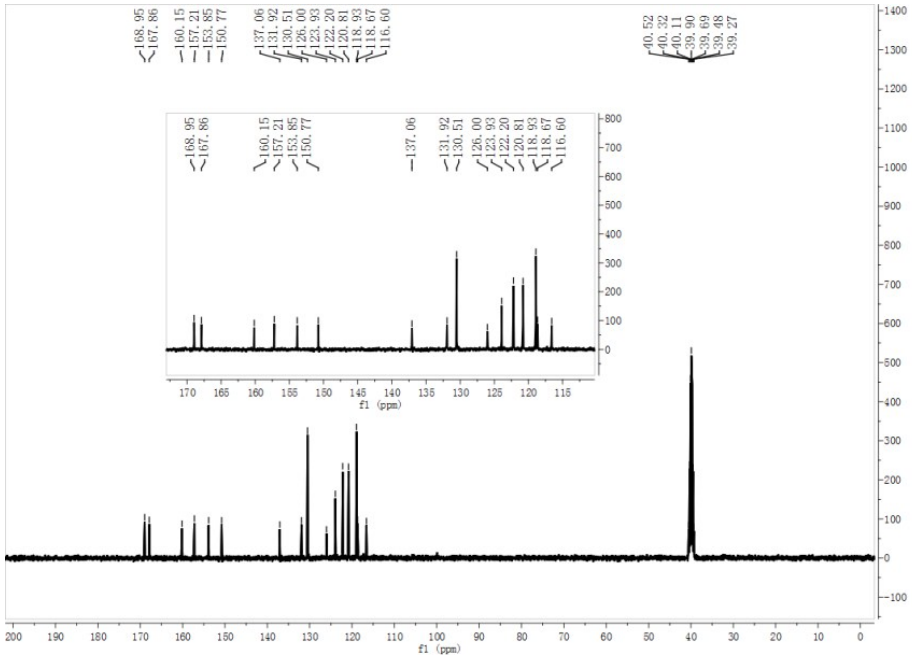

T(%)
wavenumbers(cm-1)
2227.79
1599.36
1567.78
1481.37
1423.88
1287.84
1241.28
1190.77
1092.18
1014.98
953.66
875.44
822.09
755.05
692.08
504.04

**Figure S1** FT-IR, $^{1}H$ NMR and $^{13}C$ NMR spectra of compound **1**.



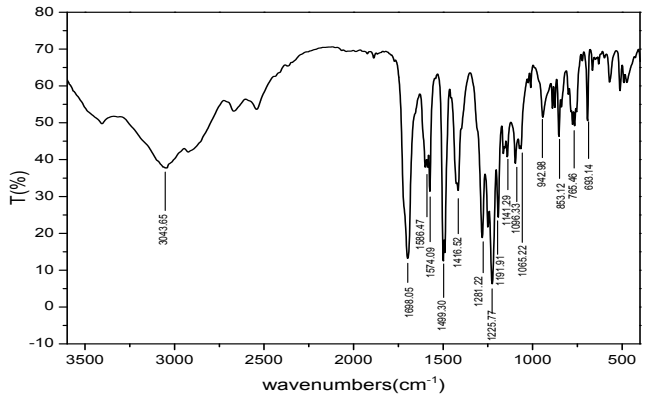
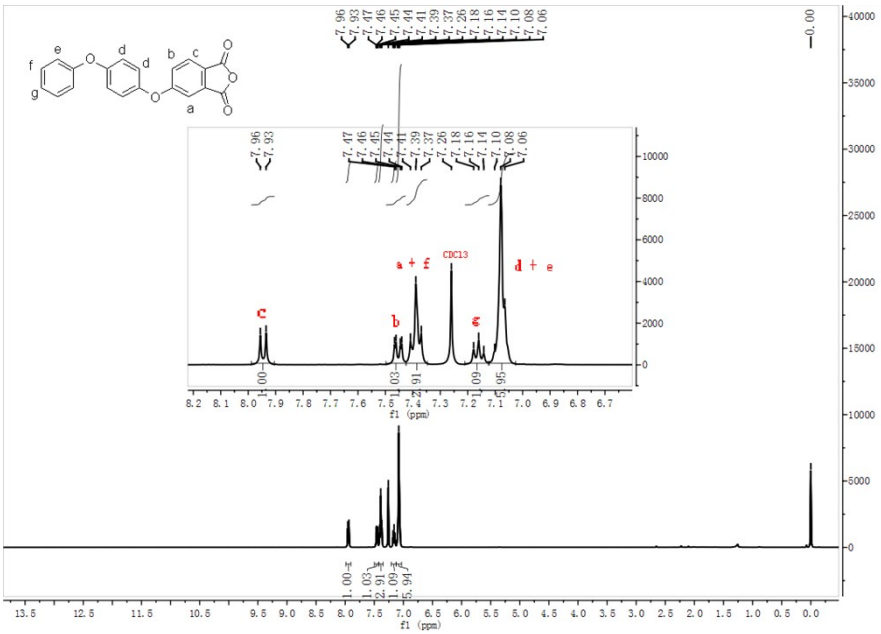
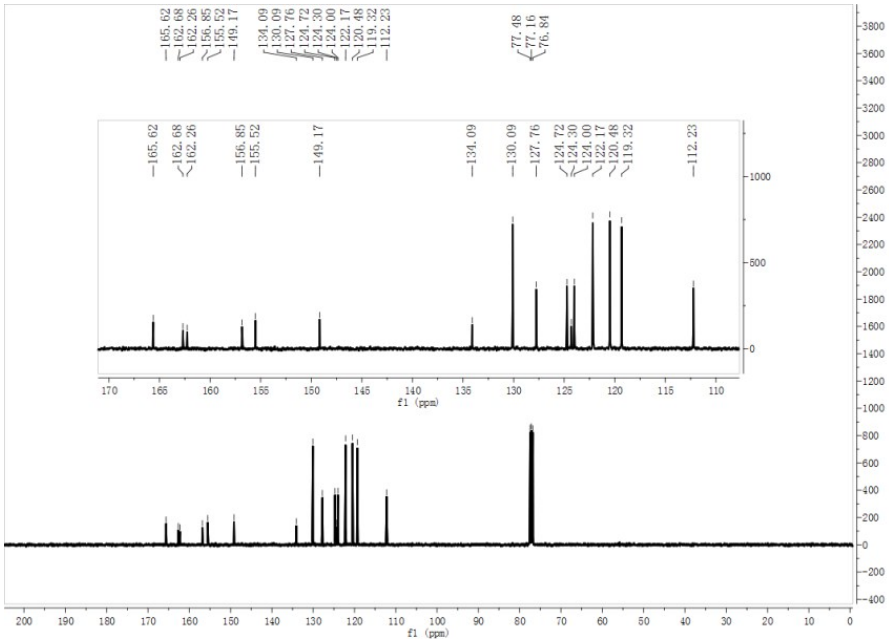



**Figure S2** FT-IR, $^{1}H$ NMR and $^{13}C$ NMR spectra of compound **2**.



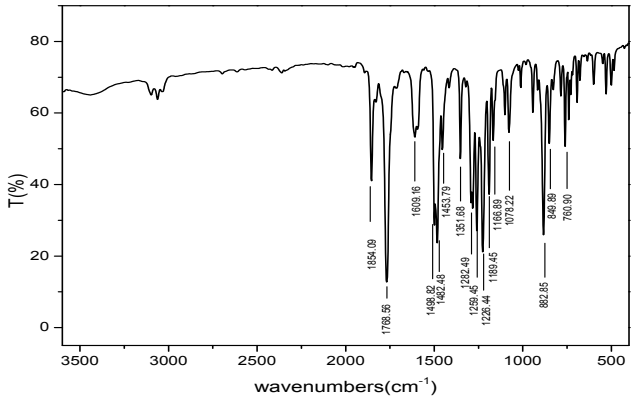



**Figure S3** FT-IR, $^{1}H$ NMR and $^{13}C$ NMR spectra of $AB_2$ monomer.

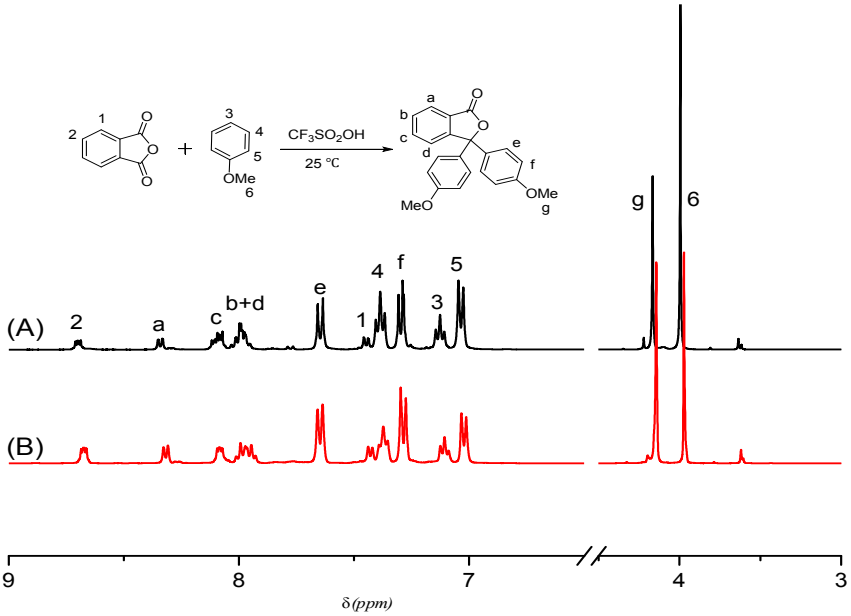



**Figure S4** $^{1}H$ NMR spectra in $CDCl_3$ of products obtained by the model reaction between isobenzofuran-1, 3-dione(1 mmol) and anisole(2 mmol) in the presence of $CF_3SO_3H$ (1 mL); (A) t = 30 min. (B) t = 5 h.

The model reaction between isobenzofuran-1, 3-dione(1 mmol) and anisole(2 mmol) is carried out in the presence of trifluotomethanesulfonic acid (TFSA) at 25 °C. The model reaction was monitored by using $^{1}H$ NMR spectroscopy. The $^{1}H$ NMR spectra show the formation of the expected diarylated products **3**, and no peaks corresponding to the monosubstituted compounds and other side reaction products are observed. Based on these findings and our knowledge about the superelectrophile, we think that the condensation proceeds via alcohol intermediates, whose reactivity is much higher than that of the starting material.

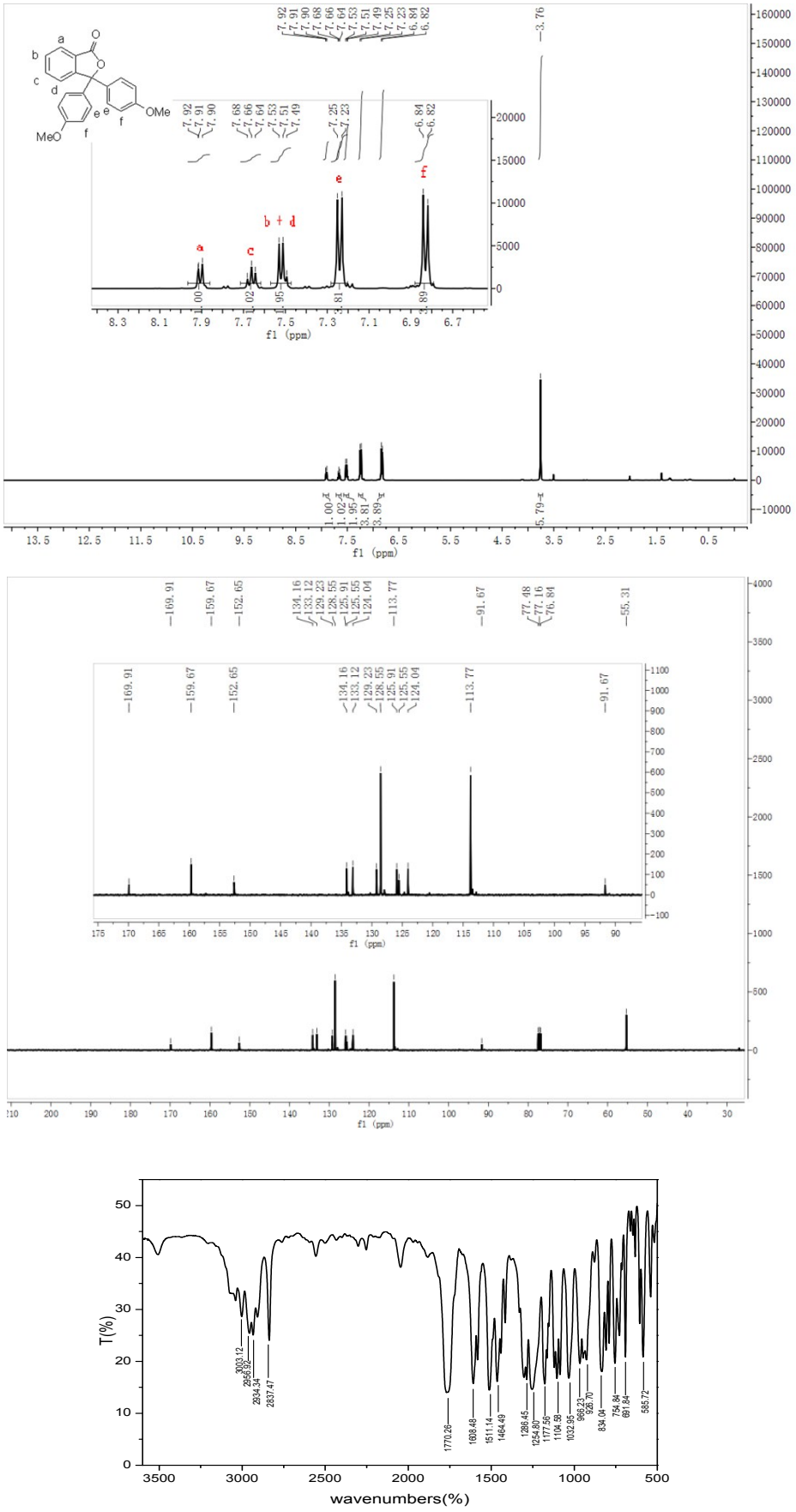



**Figure S5** FT-IR, $^{1}H$ NMR and $^{13}C$ NMR spectra of model compound **3**.

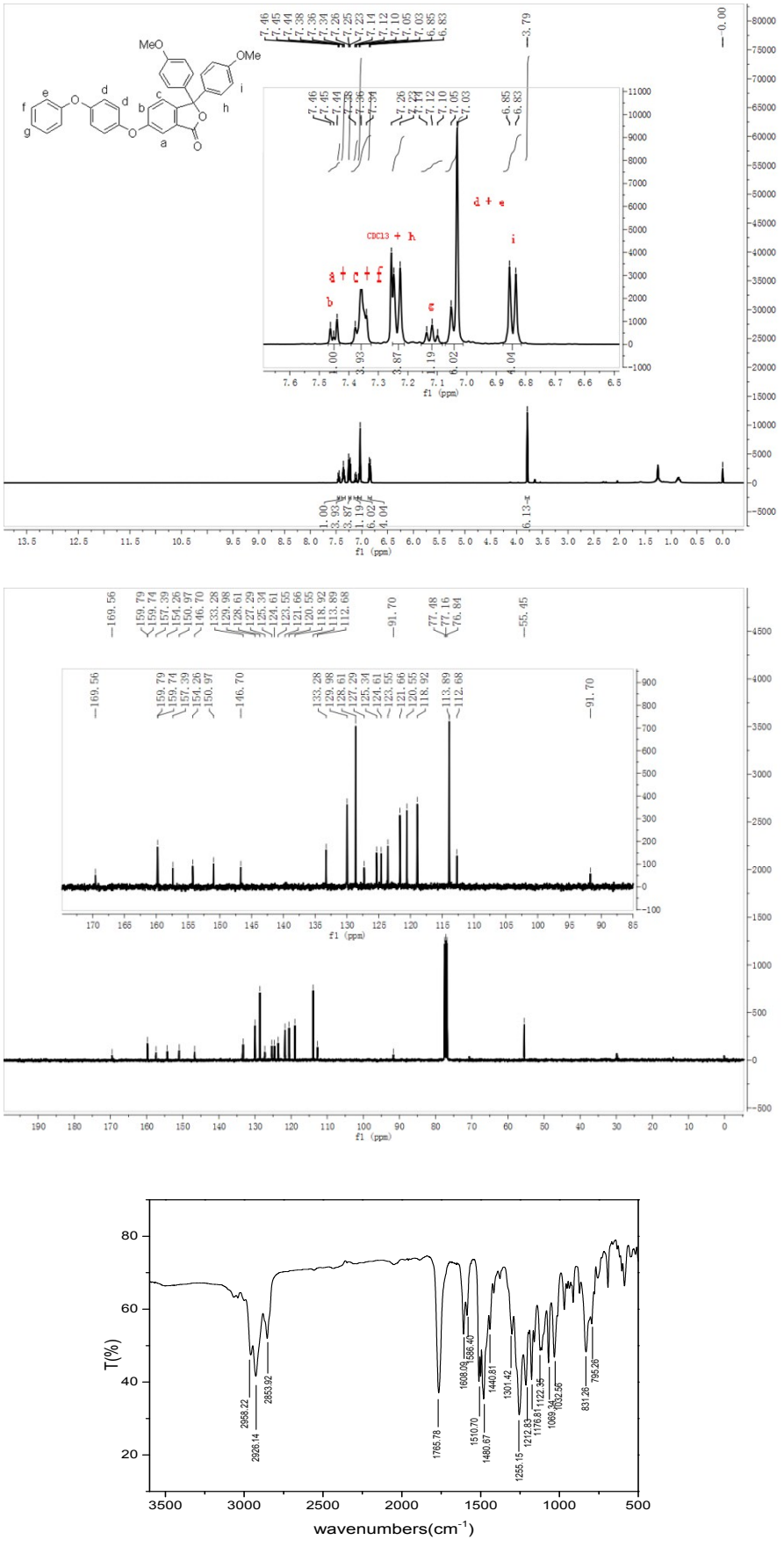



**Figure S6** FT-IR, $^{1}H$ NMR and $^{13}C$ NMR spectra of model compound **4**.

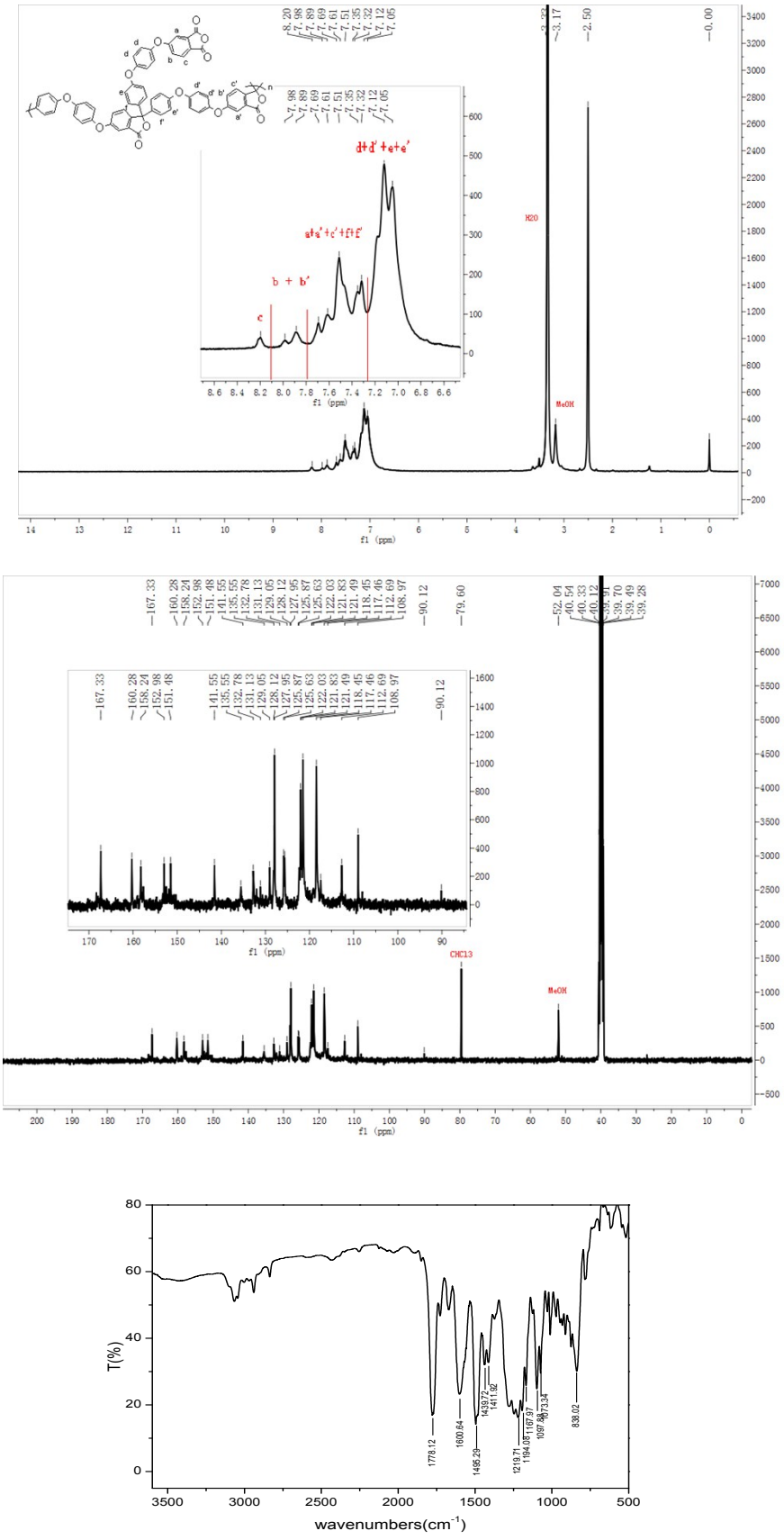



**Figure S7** FT-IR, $^{1}$H NMR and $^{13}$C NMR spectra of hyperbranched polymer **a1**.

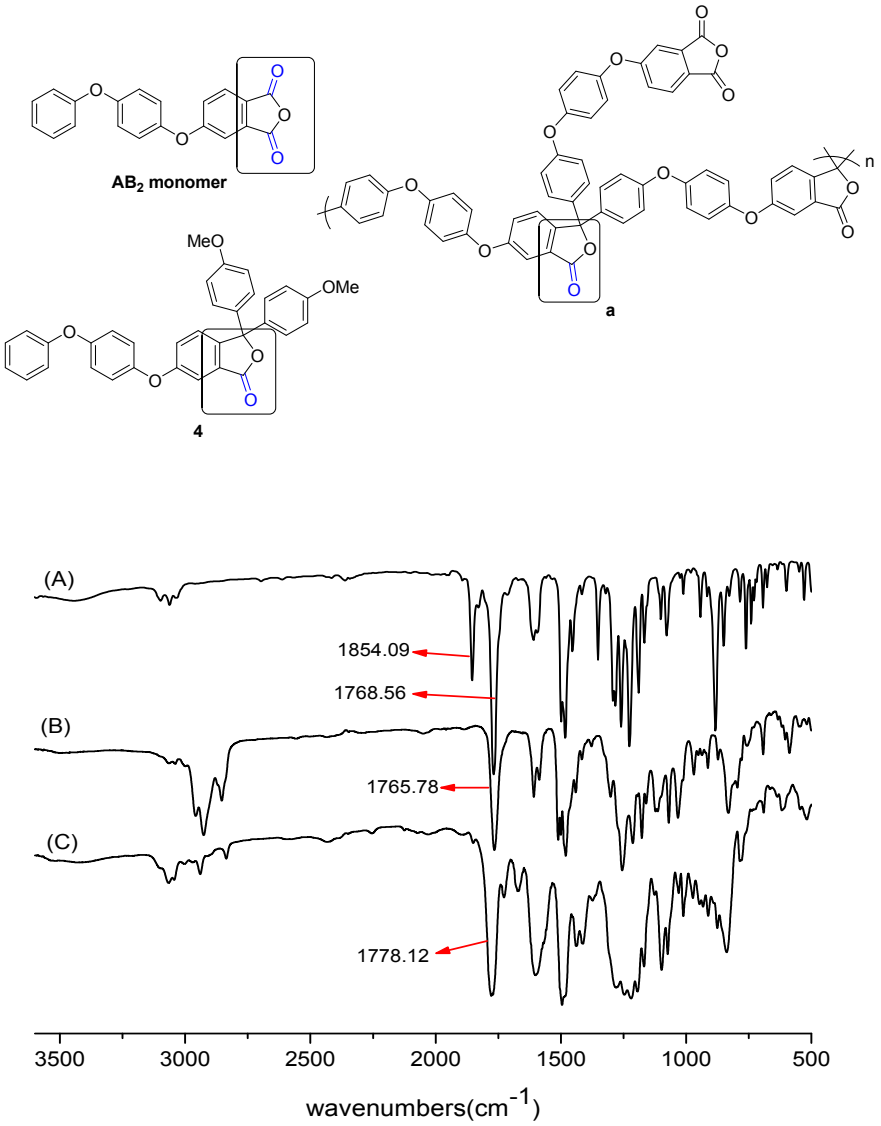



**Figure S8** FT-IR spectra of (A) **$AB_2$** monomer, (B) model compound **4**, and (C) hyperbranched polymer **a1**.