Supporting Information

Well-ordered mesoporous polymers and carbons based on oligoimide-incorporated soft materials

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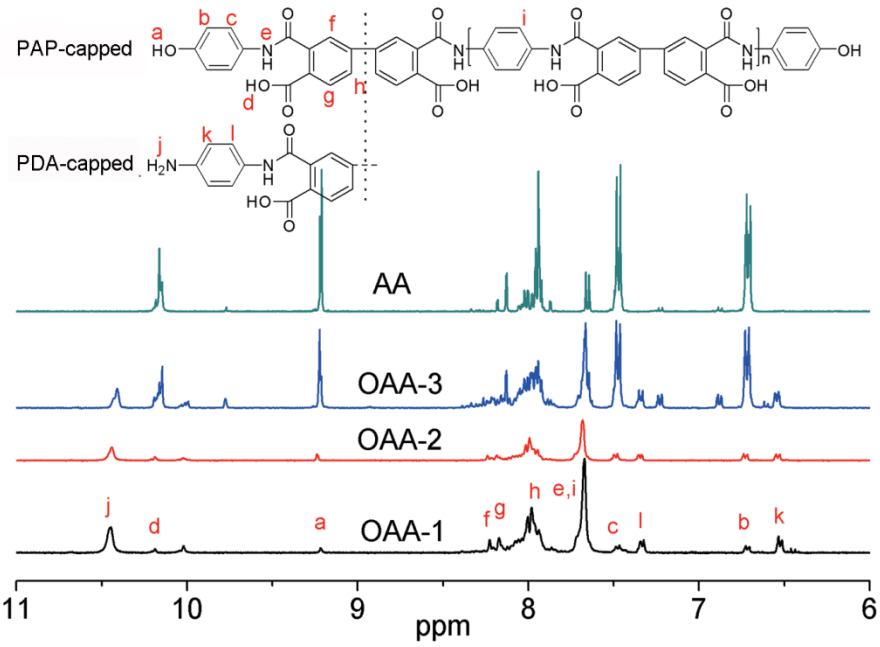

Fig. S1 ^{1}H NMR spectra of small molecular amic acid and oligo(amic acid)s with different molecular weights.

Calculation of molecular weights of oligo(amic acid)s:

The molecular weights of oligo(AA) were calculated by comparing the amount of the ortho-hydrogen atoms of phenol end groups and the hydrogens on the benzene ring of BPDA structure, i.e. the peak area ratio of (f+g+h)/(b+k) (see above Fig. S1). The formula for calculating molecular weight is as follows:

$$M_{\mathrm{n}} = \frac{(f+g+h)\cdot(326.3+0.5\times 76.1)}{(b+k)} \times \frac{4}{6} + 2\times 93.1$$

$$\left(\frac{f+g+h}{b+k} > 1.5\right)$$

In which 326.3 is the relative molecular mass of BPDA structure in the main chain of oligo(amic acid)s and 76.1 is the relative molecular mass of the benzene ring attributed by PDA.

By substituting the value of (f+g+k)/(b+k), the molecular weights of oligo(amic acid)s are calculated to be 2158, 1435, and 711 for OAA-1, OAA-2 and OAA-3 respectively.

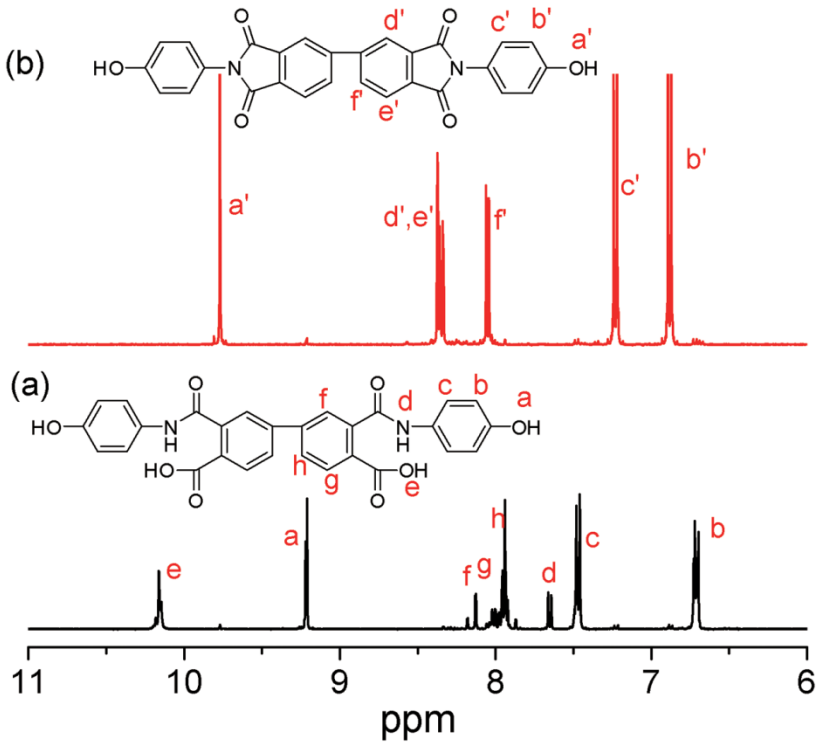

Fig. S2 ^{1}H NMR spectra of the products of AA after being heated at 100 °C for 24 h (a) without DMF and (b) with the existence of small residual DMF.

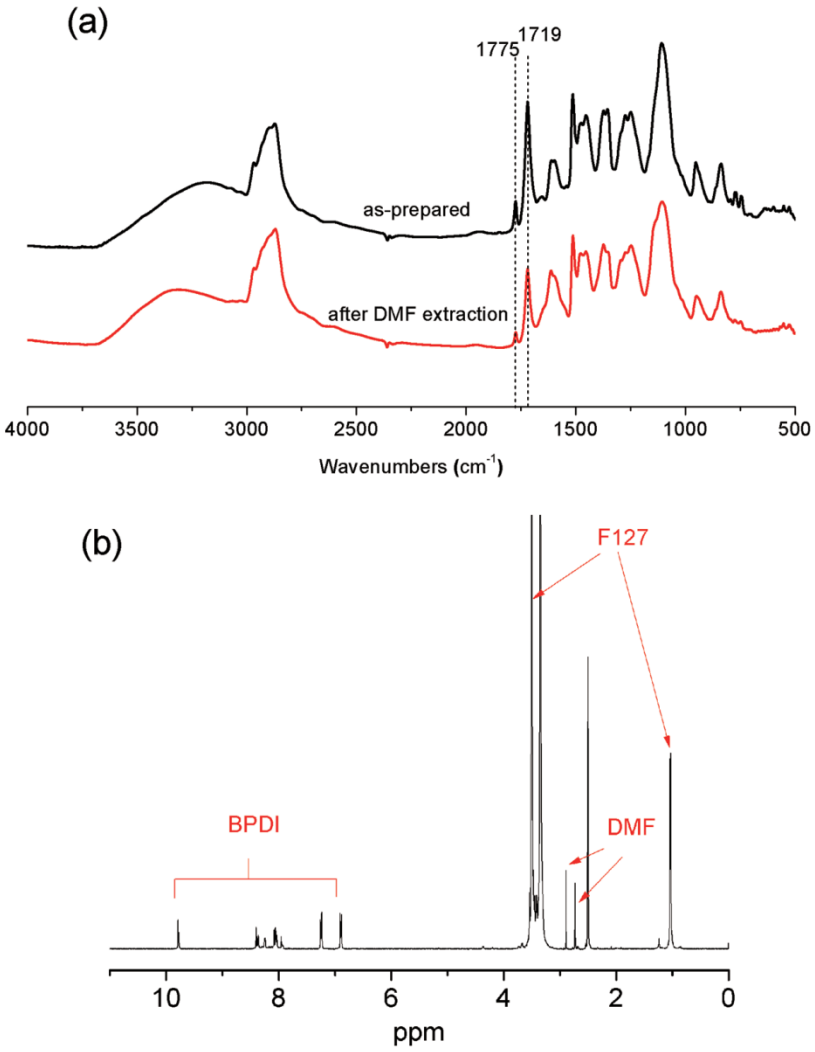

Fig. S3 (a) FTIR spectra of the composite polymer films before and after DMF extraction at room temperature for 24 h; (b) ^{1}H NMR spectrum of the DMSO-d_6 extracting solution of the as-prepared polymer film at room temperature for 24 h.

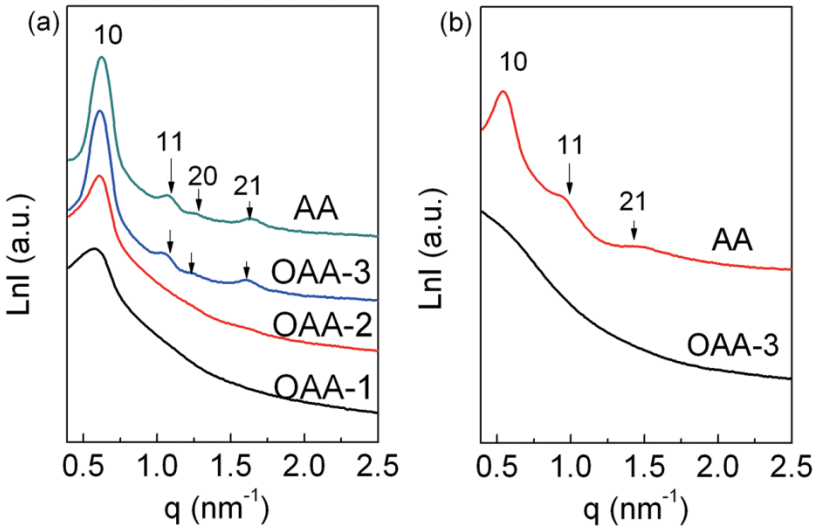

Fig. S4 SAXS profiles of the crosslinked polymer films prepared from different oligo(amic acid)s with the ratios of (a) resol:OAA:F127 = 3:1:4 and (b) resol:OAA:F127 = 1:1:1 (wt %).

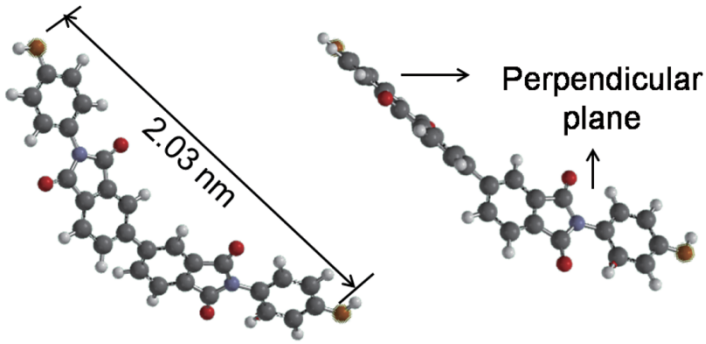

Fig. S5 Structure of BPDI from molecular simulation.

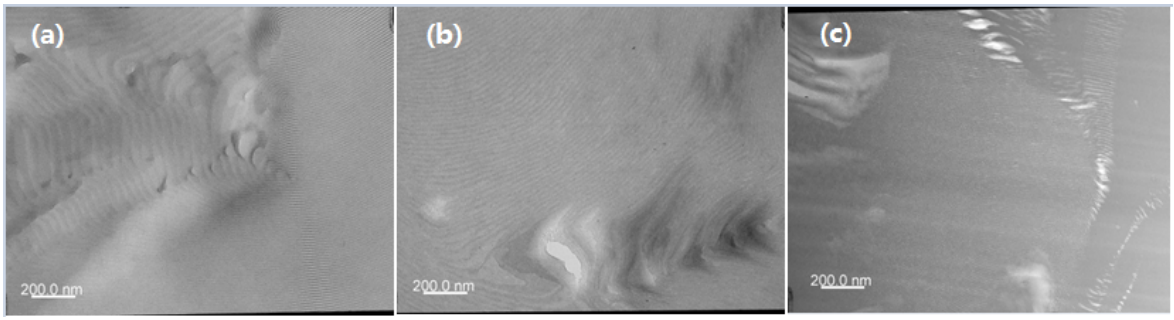

Fig. S6 TEM images of (a) as-prepared composite film, (b) IMP, and (c) NMC with lamellar mesostructures in a large scope.