Supporting information

Determination methods

^{1}H NMR and ^{13}C NMR spectra were recorded at 297 K on a Bruker Avance 300 or 500 MHz NMR spectrometers using $CDCl_3$ as solvent and TMS as internal standard. Infrared spectra were obtained with a Bruker Tensor 27 FT-IR spectrometer. Differential scanning calorimetry (DSC) patterns and thermogravimetric analysis (TGA) patterns were recorded with a Mettler-Toledo TGA/DSC 1 Thermogravimetric Analyzer with the temperature scanned from 50 to 300 °C at 10 °C /min. Fluorescence microscopy images were obtained on Olympus BX51 imaging system excited at 365 nm. UV-Vis absorption spectra were recorded on a Shimadzu UV-3600 spectrometer. Fluorescence spectra were obtained on a Horiba FluoroMax 4 spectrofluorometer. Solid fluorescent quantum yields were performed using Quanta–φ accessory with excitation wavelength at 320 nm. Elemental analysis was carried out on Vario MICRO.

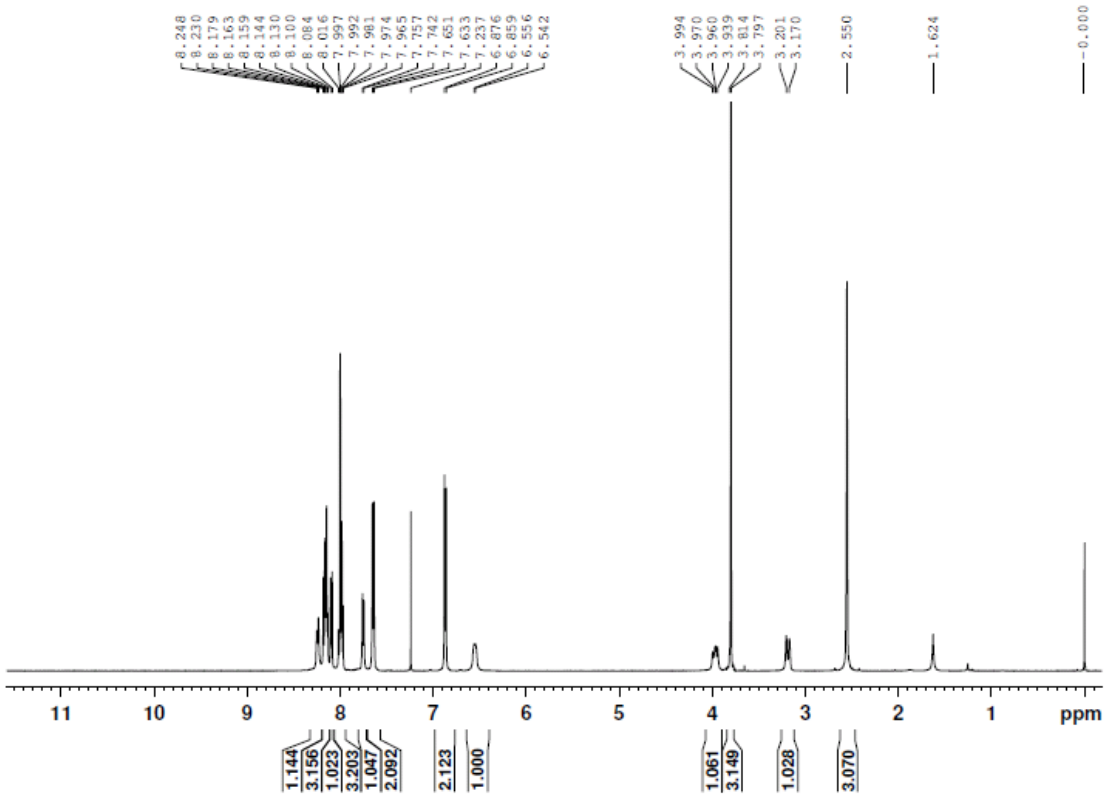

Figure 1S. ^{1}H NMR spectrum of AMPP.

Assignments of each H in the NMR spectrum of AMPP: δ (ppm) 2.55 ($CO-CH_3$), 3.17-3.20 (one H of CH_2), 3.80-3.81 ($-OCH_3$), 3.94-3.99 (another H of CH_2), 6.54-6.56 (CH), 6.86-8.25 (13H, Ar-H from pyrene and benzene rings).

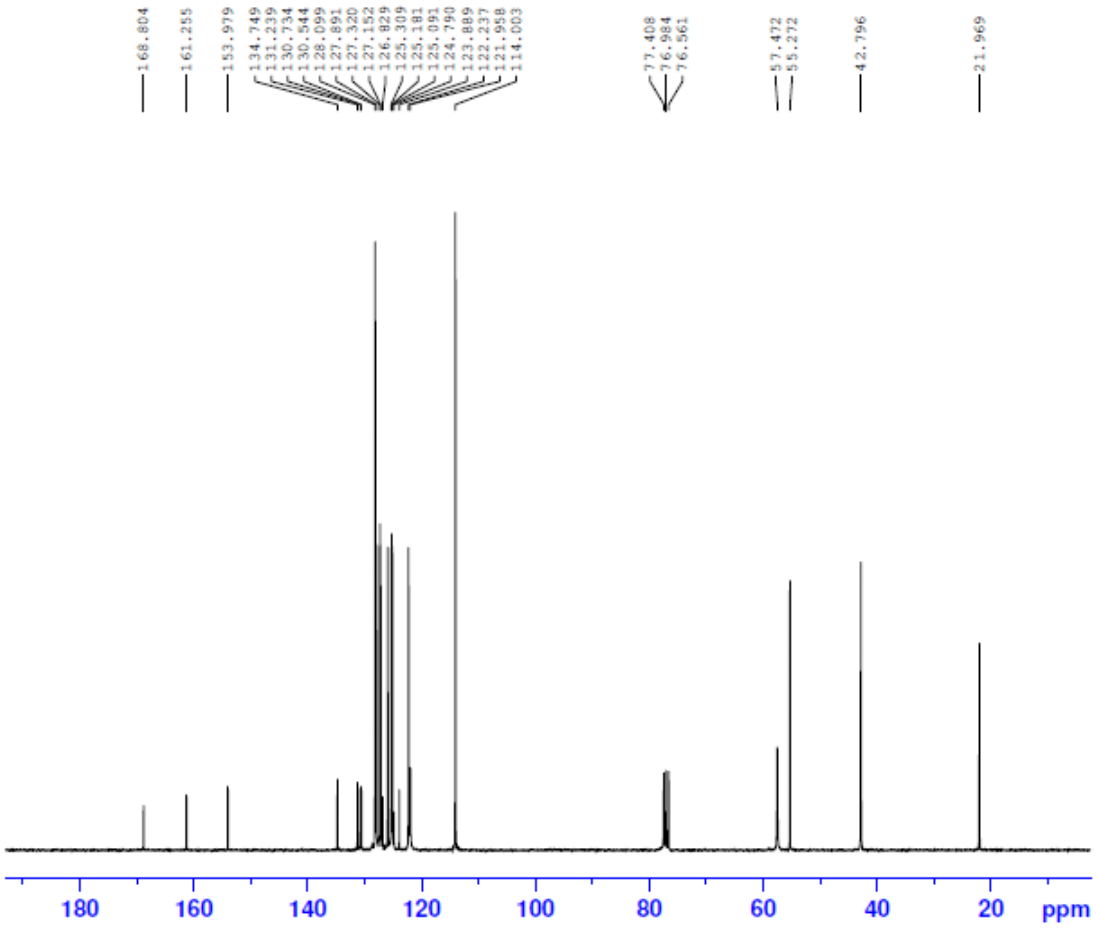

Figure 2S. ^{13}C NMR spectrum of AMPP.

Assignments of C in the NMR spectrum of AMPP: δ (ppm) 21.97 (C*-CO), 42.79 (CH_2), 55.27 (-OCH_3), 57.47 (CH-N), 114.00-134.75 (the rest Ar-C from pyrene and benzene rings), 153.98 (C=N), 161.26 (C*-OCH_3), 168.80 (C=O). (21.97 and 161.26 are assigned to the two C* respectively).

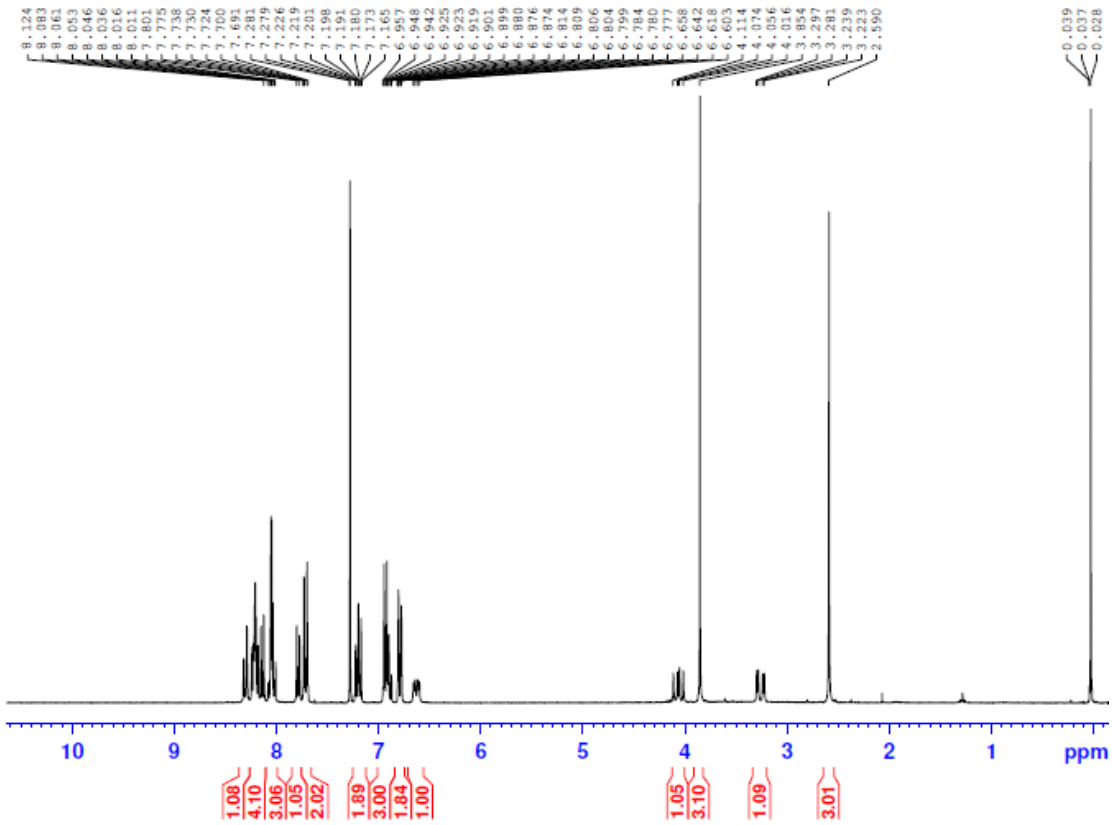

Figure 3S. [1]H NMR spectrum of AMPP-phenol cocrystal.

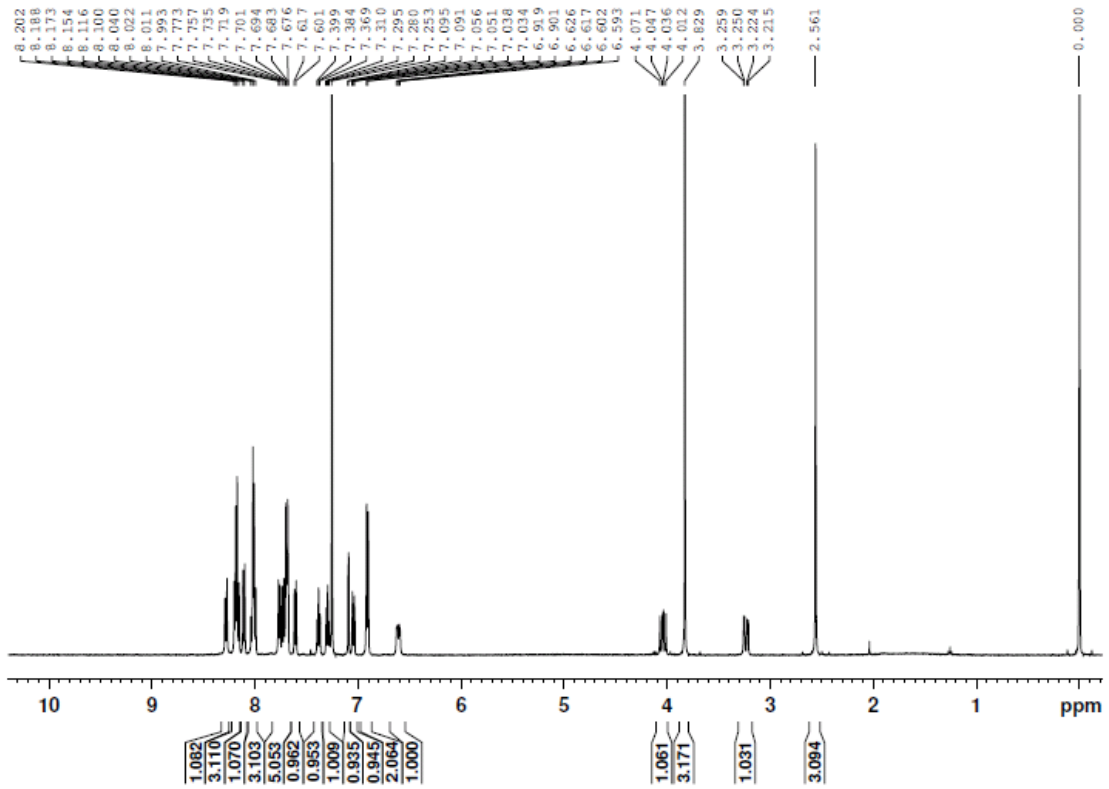

Figure 4S. [1]H NMR spectrum of AMPP-(2-naphthol) cocrystal.

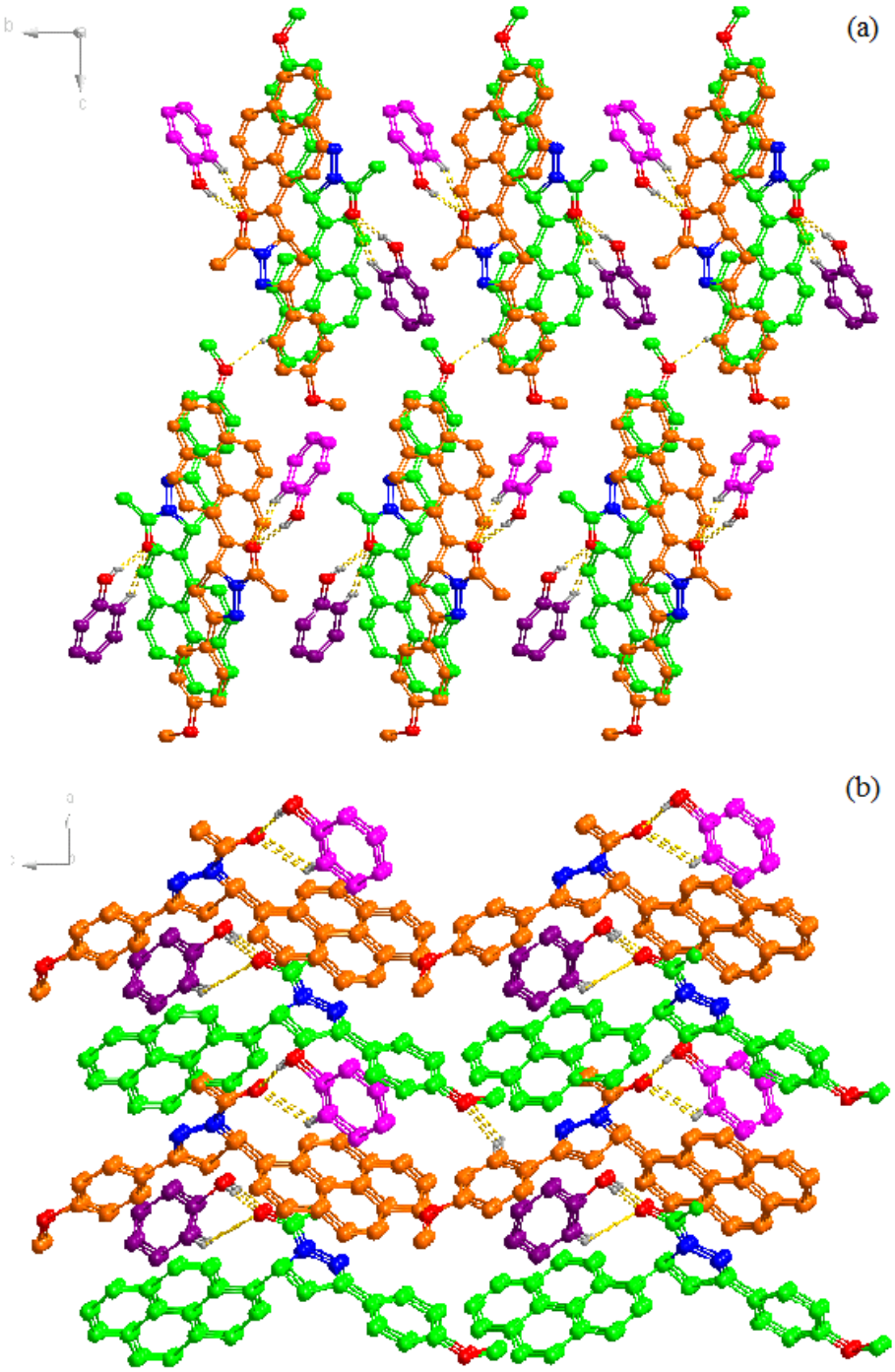

Figure 5S. The hydrogen bonding networks constructed by AMPP and phenol molecules in crystal II, hydrogen bonds are presented by dashed lines. (a) view along the *bc* plane (b) view along the *ac* plane. Partial hydrogen atoms not participating in the interactions have been omitted for clarity.

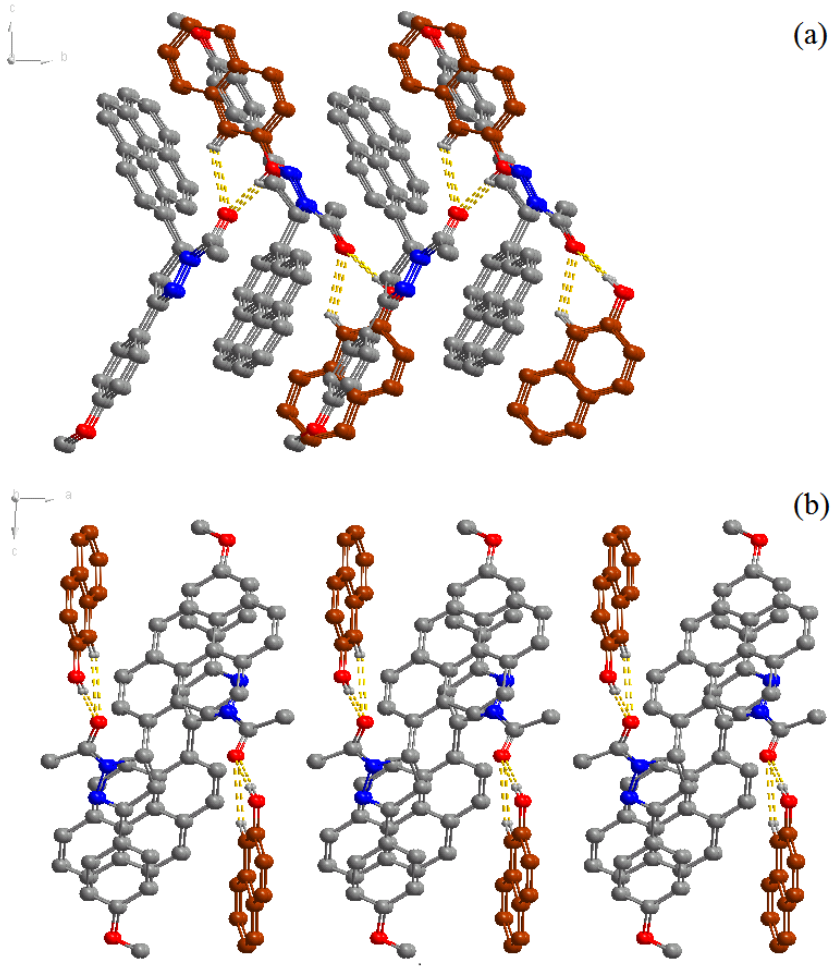

Figure 6S. The hydrogen bonding networks constructed by AMPP and 2-naphthol molecules in crystal III, hydrogen bonds are presented by dashed lines. (a) view along the *bc* plane (b) view along the *ac* plane. Partial hydrogen atoms not participating in the interactions have been omitted for clarity.

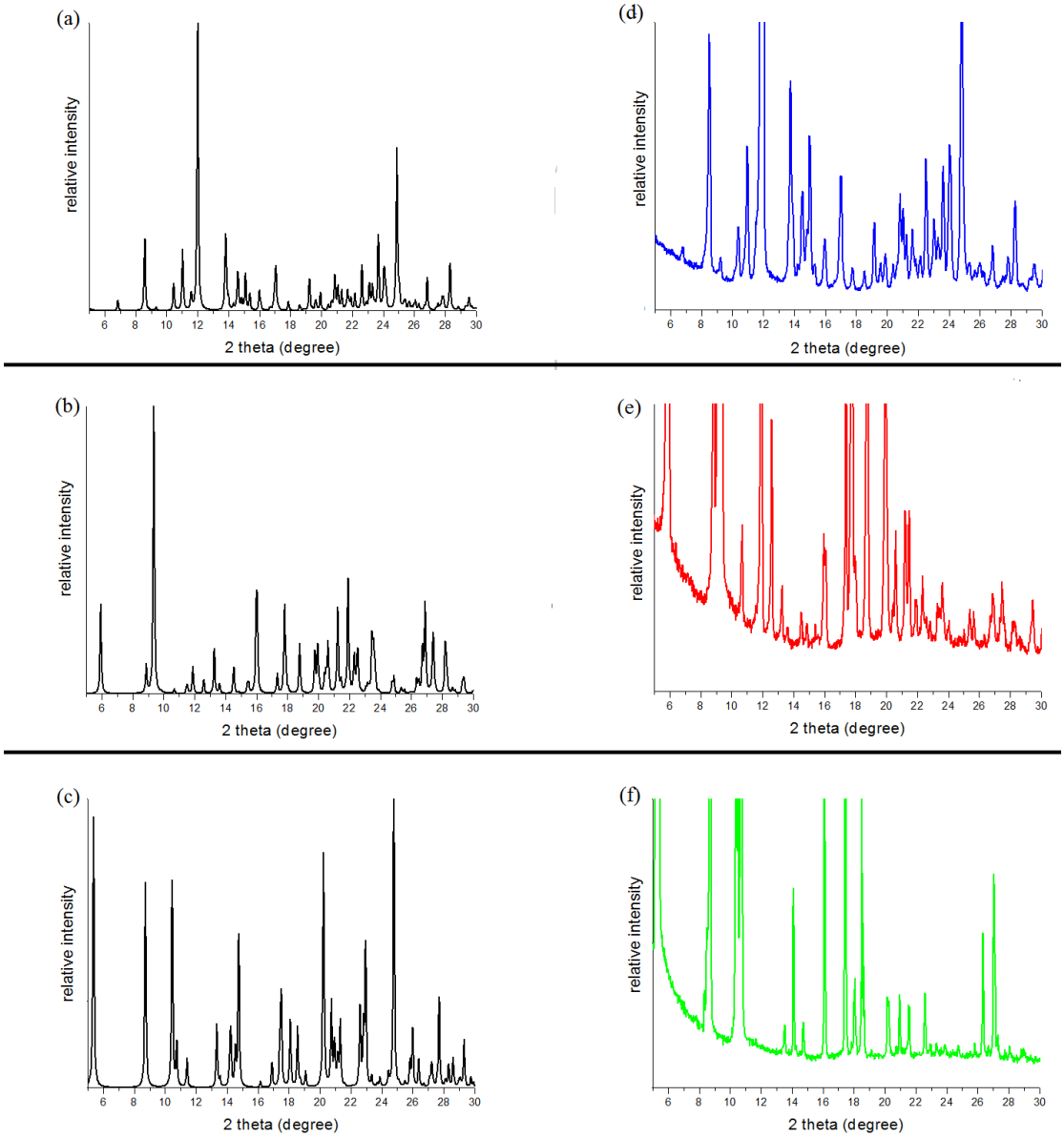

Figure 7S. The simulated PXRD patterns of crystals I (a), II (b) and III (c) and the partial magnified observed PXRD patterns of crystals I (d), II (e) and III (f).

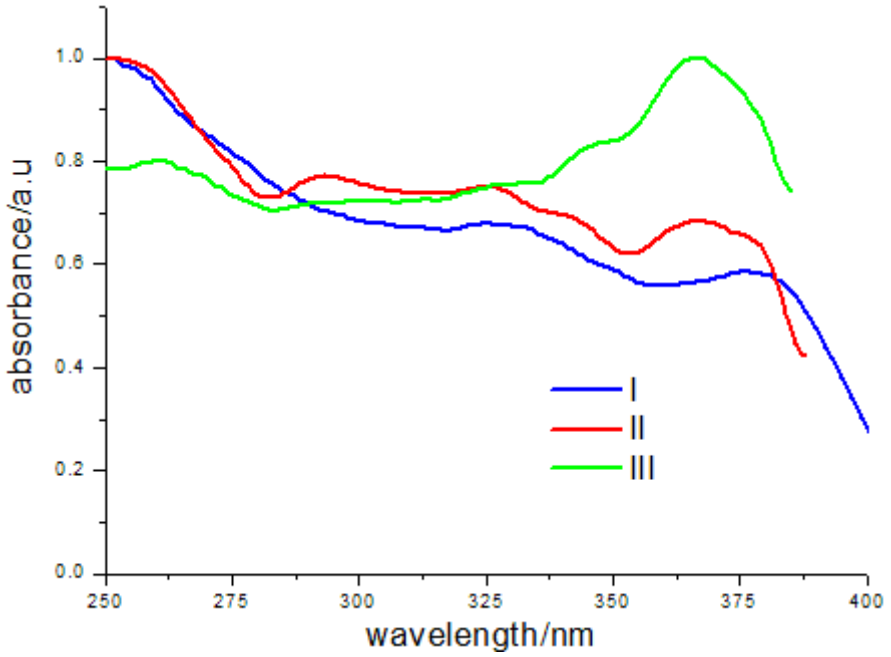

Figure 8S. Excitation spectra for the three crystals.

Table 1S. Hydrogen bonds parameters in crystals I-III

D-H…A	D-H(Å)	H…A(Å)	D…A(Å)	∠D-H…A (°)
I				
C22-H22…O4	0.930	2.655	3.520	155.00
C23-H23…O4	0.980	2.668	3.581	155.22
C39-H39…O3	0.929	2.719	3.604	159.46
II				
O3-H3A…O4	0.821	1.922	2.793	173.11
C30-H30A…O4	0.930	2.576	3.275	132.29
C57-H57A…O2	0.930	2.613	3.425	146.29
O6-H6A…O1	0.821	1.856	2.677	179.44
C68-H68A…O1	0.930	2.584	3.285	132.47
III				
O3-H3B…O1	0.820	1.840	2.659	178.84
C38-H38A…O1	0.930	2.627	3.291	128.88

Table 2S. C-H…π interactions in crystals I-III

	$d_{H\text{-}c}$(Å)	∠C-H…*c*(°)
I		
C34-H34…Pyrene(B)	2.825	148.06
C52-H52C…Pyrene (B)	2.979	107.57
C48-H48…Pyrene (A)	2.842	147.15
C13-H13…Pyrene (B)	2.986	176.75
II		
C30-H30A…Pyrene (B)	2.975	141.71
C31-H31A…Pyrene (B)	2.808	150.93
C17-H17A…Pyrene (B)	2.810	140.00
C67-H67A…Pyrene (A)	2.774	156.64
C51-H51A…Pyrene (A)	2.820	140.04