Supporting Information

Discovering the polymerization mechanism of aromatic carbon nitride

Shubing Tian[1], Kai Zhang[1,2], Zhiyu Song[1], Ning Wu[1], Mingze Sun[1], Xilei Chen[2], Xuelu Wang[3], JiXiang Xu[1], Mingming Zhang[1,4], Fangxu Dai[1,5], Lei Wang[1] and Jun Xing[1],*

[1]Key Laboratory of Eco-chemical Engineering, Ministry of Education, College of Chemistry and Molecular Engineering, Qingdao University of Science & Technology, 266042 Qingdao, China.

[2]Shandong Engineering Research Center for Marine Environment Corrosion and Safety Protection, College of Environment and Safety Engineering, Qingdao University of Science & Technology, 266042 Qingdao, China.

[3]Shanghai Key Laboratory of Magnetic Resonance, School of Physics and Electronic Science, East China Normal University, Shanghai 200241, China.

[4]College of Sino-German Science and Technology, Qingdao University of Science & Technology, Qingdao 266042, China.

[5]School of Pharmacy, Jining Medical University, 276800 Rizhao, China

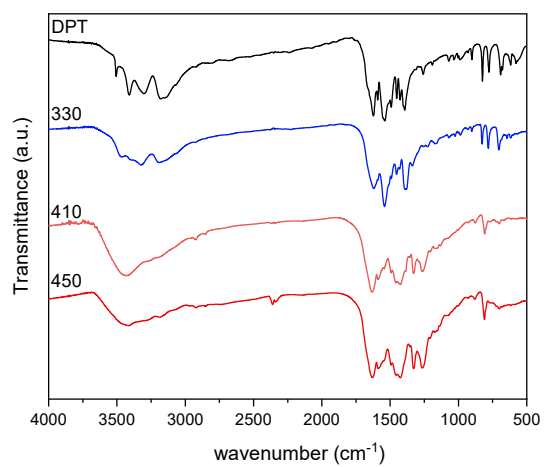*Correspondence: xingjun@qust.edu.cn

Figure S1 FT-IR spectra of DPT, the product obtained at 330 °C, samples **410** and **450**.
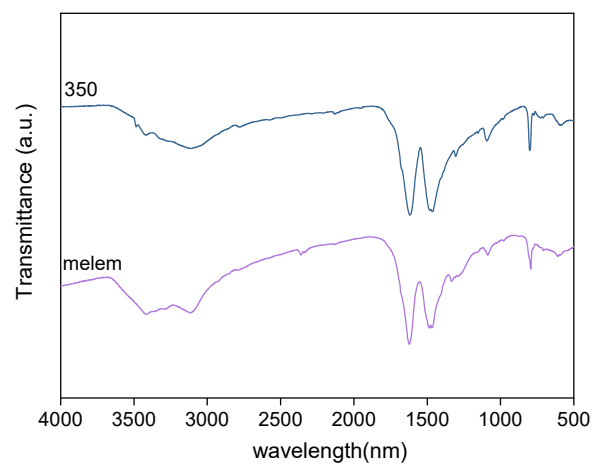
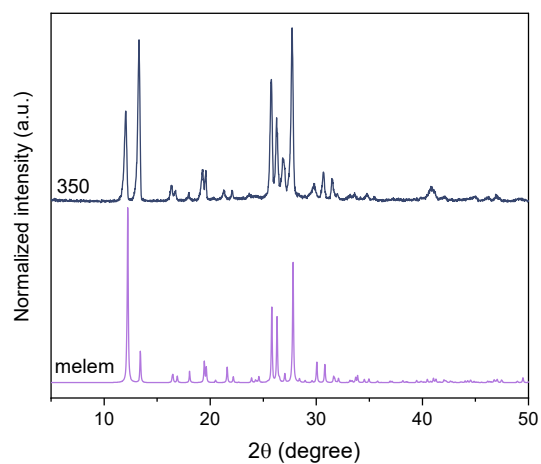**Figure S2** FT-IR spectra of sample **350** and melem.

Figure S3 XRD patterns of sample **350** and melem. The XRD pattern of melem is

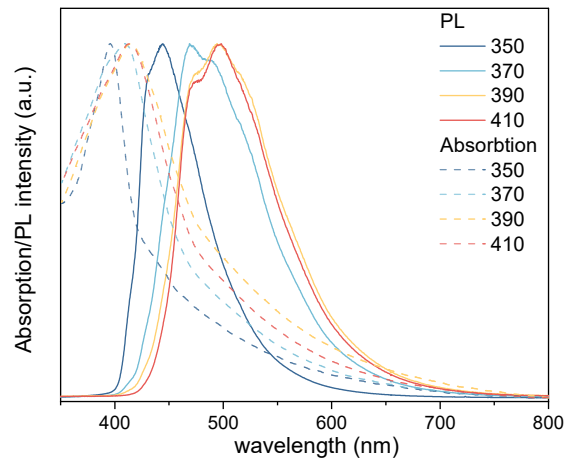cited from B. Jürgens et al., J. Am. Chem. Soc., 2003, 125, 10288-10300.

Figure S4 UV-vis absorption and PL spectra of samples **350**, **370**, **390** and **410**.

Table S1. PL fitting data of samples **350**, **370**, **390** and **410**.

sample	peak fit	peak center (nm)	peak area	peak area percentage (%)
350	Peak 1	414	2.64	3.40
	Peak 2	428	8.69	11.18
	Peak 3	443	25.82	33.22
	Peak 4	468	19.50	25.08
	Peak 5	493	9.85	12.68
	Peak 6	520	6.08	7.83
	Peak 7	552	2.68	3.45
	Peak 8	590	2.47	3.18
370	Peak 1	426	2.07	1.87
	Peak 2	445	10.02	9.08
	Peak 3	467	25.24	22.87
	Peak 4	492	22.58	20.46
	Peak 5	520	24.89	22.55
	Peak 6	555	12.07	10.94
	Peak 7	590	9.57	8.67
	Peak 8	658	3.92	3.55
390	Peak 1	445	6.02	5.36
	Peak 2	468	21.50	19.13
	Peak 3	492	25.23	22.45
	Peak 4	520	26.89	23.93
	Peak 5	552	18.47	16.43
	Peak 6	592	10.52	9.36
	Peak 7	652	3.75	3.34
410	Peak 1	446	4.00	3.62
	Peak 2	468	20.80	18.81
	Peak 3	494	25.66	23.21
	Peak 4	520	24.37	22.04
	Peak 5	551	19.42	17.57
	Peak 6	591	11.79	10.67
	Peak 7	657	4.53	4.10

Table S2. PL lifetime of samples **350**, **370**, **390** and **410**.

sample	Emission wavelength (nm)	τ_1 (ns)	τ_2 (ns)	τ_{ave} (ns)	A_1	A_2
350	414	1.368	7.850	2.491	0.928	0.034
	428	1.484	5.907	2.069	0.974	0.037
	443	1.392	6.735	3.430	0.826	0.105
	468	1.439	6.876	3.984	0.788	0.145
	493	1.530	7.575	4.420	0.799	0.148
	529	1.181	4.970	3.601	0.604	0.254
	552	0.718	3.389	2.862	0.499	0.430
	590	0.354	2.947	2.291	0.754	0.268
370	426	0.734	3.094	2.243	0.617	0.259
	445	1.115	6.221	5.184	0.479	0.336
	467	1.48	8.287	6.938	0.442	0.319
	492	1.462	8.302	7.213	0.401	0.373
	520	1.651	8.384	7.468	0.303	0.379
	555	1.797	8.785	7.623	0.330	0.339
	590	0.340	5.348	4.895	0.528	0.337
390	445	0.959	5.841	5.099	0.479	0.440
	468	1.504	8.807	7.627	0.425	0.377
	493	1.947	10.628	9.368	0.383	0.413
	520	3.329	15.776	13.540	0.338	0.326
	552	2.367	12.467	10.917	0.408	0.427
	592	0.553	6.731	6.375	0.361	0.485
	652	0.258	6.083	4.282	0.959	0.091
410	446	1.017	5.895	4.933	0.559	0.393
	468	1.618	9.679	8.121	0.524	0.365
	493	1.541	10.366	9.240	0.414	0.421
	520	1.979	10.480	9.446	0.323	0.440
	551	2.464	11.951	10.639	0.331	0.425
	591	1.102	7.949	7.356	0.299	0.436
	656	0.333	5.281	4.570	0.667	0.251