Electronic Supplementary Material (ESI) for Nanoscale.

Supporting Information

High-yield synthesis and optical properties of g-C_3N_4

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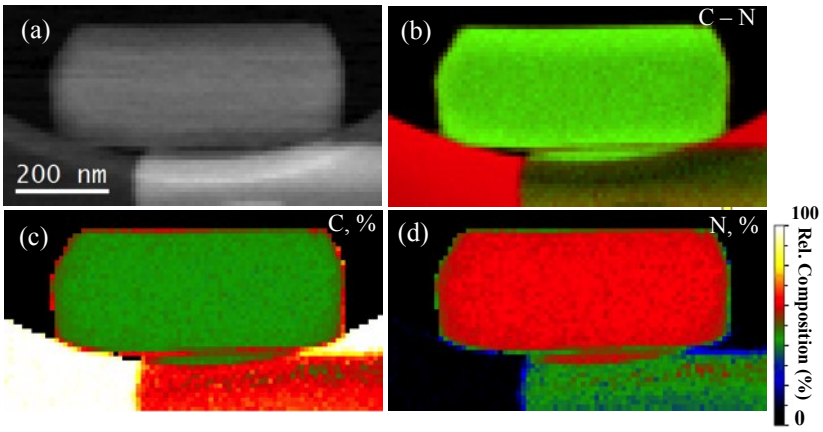

Figure S1. (a) STEM-HAADF micrograph obtained simultaneously during EELS acquisition from a g-C_3N_4 rod with a diameter of 261 nm and length of 960 nm. (b) Composite of the C (red) and N (green) elemental maps. (c-d) Relative composition of C and N in the elemental maps. The scale bars of panel (b-d) are same as that of panel (a).

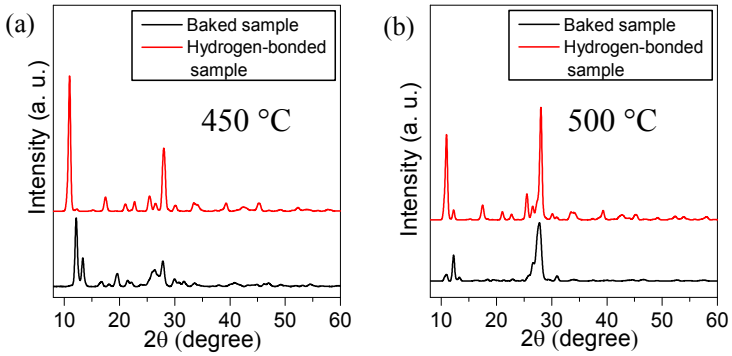

Figure S2. (a-b) Experimental XRD plots of hydrogen-bonded sample (450 °C and 500 °C) before and after baking at 100°C for 1 hour. The peak at 11.0° disappeared after water is removed from the sample.

Table 1. Raman and IR peak positions observed in this work and their related modes and descriptions of vibration. (Ra is short for Raman, s is short for strong, w is short for weak.) [1-6]

Melamine (cm^{-1})	Melem (450°C, 2h) (cm^{-1})	g-C_3N_4 (550°C,2h) (cm^{-1})	Description of vibration	Mode
		211 (Ra)		Unassigned
		302 (Ra)		Unassigned
	348 (Ra)			Unassigned
		359 (Ra)		Unassigned
381 (Ra)			Quadrant out-of-plane bending	E''
		453 (Ra)		
	471 s (Ra)	471 (Ra)	ring stretching	E'
		489 (Ra)		
	540 (Ra)			A1'
581 (Ra)			ring bending	A1
675 s (Ra)			Quadrant in-plane bend, ring	E'
		711 s (Ra)	Heptazine ring breathing modes	A1'
779 (Ra)	746 (Ra)	763(Ra)		A1'
810 (IR)	799 (IR)	802(IR)		A2' '
	890 (IR)	890(IR)		
980 (Ra)	986 (Ra)	984(Ra)	N radial, in-phase	A1'
		1112(Ra)	C radial, in-phase	A1'
1184(Ra)	1153(Ra)	1153(Ra)	Semi-circle stretching, NH_2 rocking	E'
		1215 (Ra)		Unassigned
		1233 s (Ra)	Typical stretching vibration modes of C=N and C–N heterocycles.	E'
		1311 (Ra) (IR)	Semi-circle stretching	E'
		1358 (Ra)		Unassigned
	1407 w (Ra)	1404 w (Ra) 1392(IR)	CN breathing	A1'
1439 w (Ra), 1432(IR)	1462 w (Ra), 1447(IR)	1484 w (Ra) 1452 (IR)	CN breathing	A1'
1557 w (Ra), 1528(IR)	1532 w (Ra)	1562 w (Ra) 1533(IR)	ring stretching	E'
	1589 w (Ra) 1590(IR)	1575 w (Ra) 1575(IR)	ring stretching	E'
1661 w (Ra) 1622 (IR)		1617 w (Ra) 1626 (IR)	ring stretching	E'

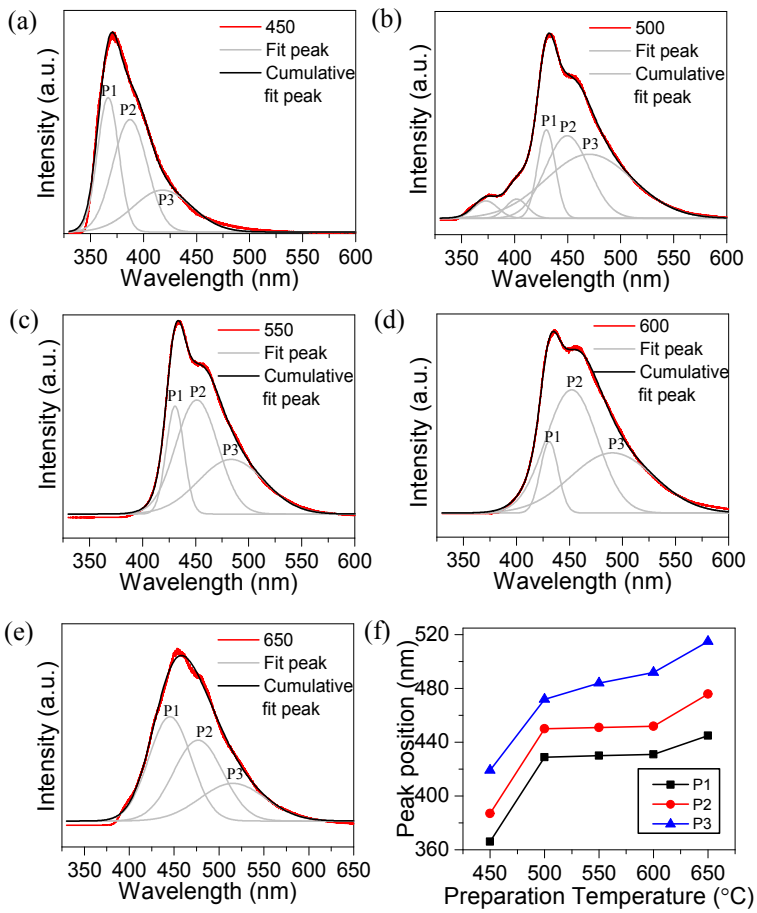

Figure S3 (a-e) The Guassian fitting of PL emission spectra of the g-C_3N_4 sample obtained under different temperature, which indicate 3 major PL peaks (P1, P2 and P3). (d) The peak position of P1, P2 and P3 from (a-e).

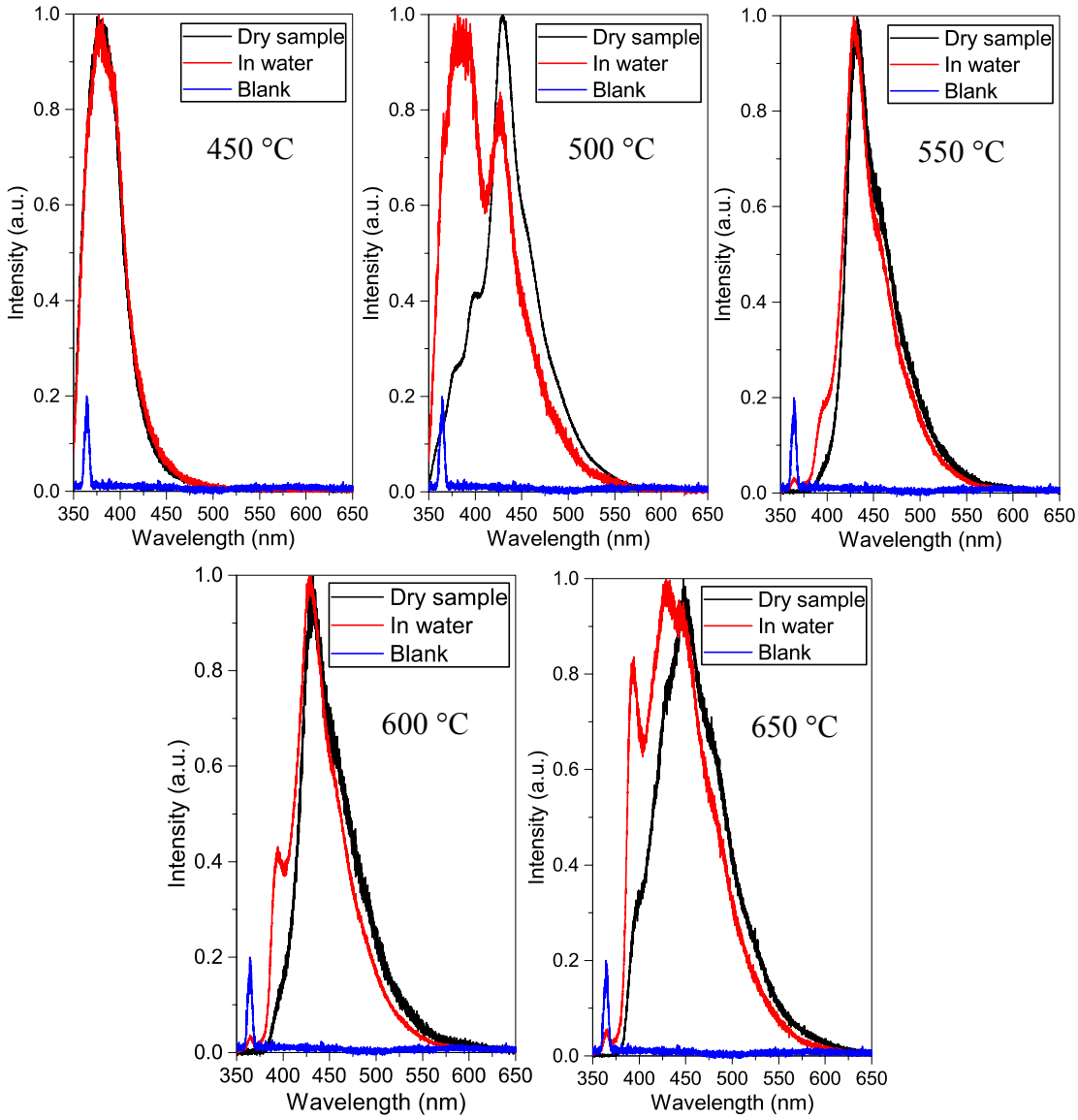

Figure S4 The normalized PL emission spectra of the g-C_3N_4 products, g-C_3N_4 products in water and the blank sample (i.e., pure DI water). The peak at 365 nm in blank sample is from the Rayleigh scattering.

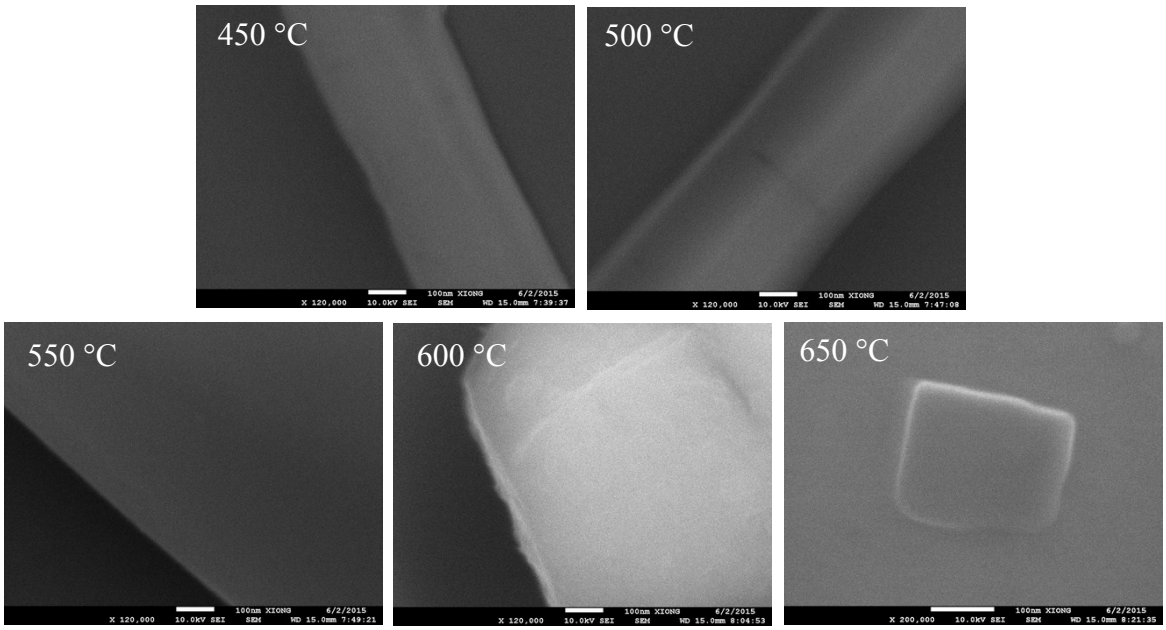

Figure S5 The SEM image of the surface of the g-C_3N_4 products obtained from 450 °C to 650 °C, all the scale bar are 100 nm.

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