Electronic Supplementary Material (ESI) for Nanoscale Advances.

Supporting Information

Facile Covalent Functionalization of Boron Nitride Nanotubes via Coupling Reaction

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Supporting Table 1. Reaction optimization

Sample	Factors change from standard condition a	Atomic %[b]			
		B	C	N	O
BNNTs		52.53	4.17	40.73	2.57
1	H_2O/EtOH	50.42	7.21	39.20	3.35
2	H_2O	49.34	7.70	39.22	3.75
3	EtOH	47.32	10.51	37.80	4.37
4	Acetone	49.50	7.41	39.54	3.55
5	**$CHCl_3$**	**36.01**	**20.69**	**28.22**	**6.91**
6	200 mg salt	47.05	10.24	38.48	4.23
7	3 days	47.17	11.13	37.00	4.70
8	100°C	48.00	9.51	37.22	5.27

[a:] Reaction Conditions:100 mg salt, 10 mg BNNTs, and 10 ml solvent, 18h, 55°C. [b:] Determined using XPS analysis.

Samples 1-5 were prepared using standard reaction conditions [a]. Samples 6-8 were prepared using standard reaction conditions [a], with chloroform ($CHCl_3$) as the solvent and modified specific factor, as indicated in the table. 5 is an optimized sample (highlighted).

Supporting Table 2. Important IR peak

Sample	Important peak
BNNT	1374, 811, 795
3a	2920, 2848, 1373, 795
3b	2924, 2847, 1378, 803
3c	2925, 2845, 1377, 801
3d	2925, 2852, 1740, 1374, 798
3e	2925, 2883, 2194, 1653, 1379, 809
3f	2960, 1507, 1456, 1373, 940, 806
3g	2924, 2845, 1377, 800

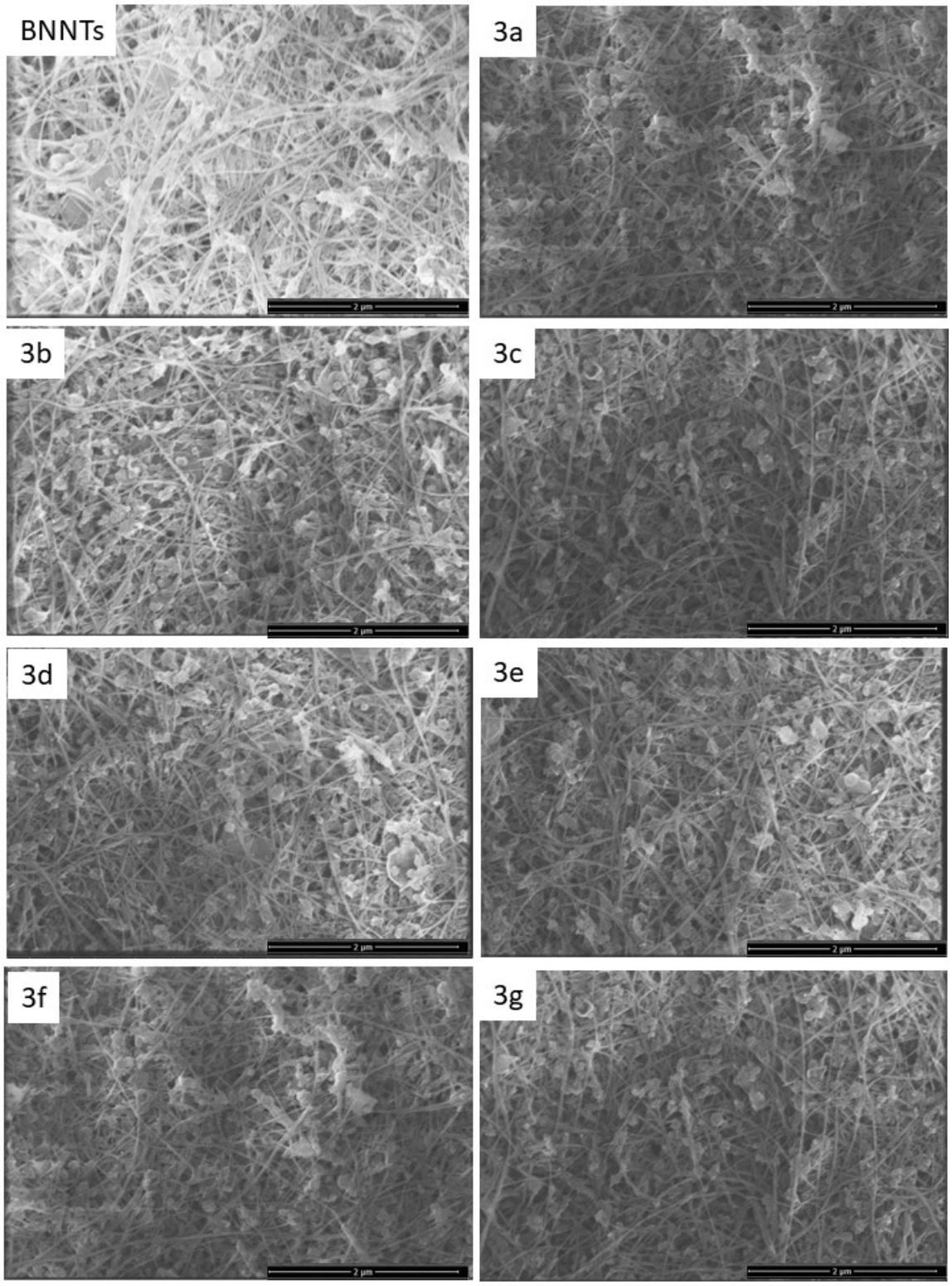
Supporting Table 3. XPS composition of BNNTs and 3a-3g

Sample	Atomic %[b]					
	B	C	N	O	F	Br
BNNTs	52.53	4.17	40.73	2.57		
3a	49.17	8.40	37.75	4.45		0.22
3b	49.03	8.39	37.64	4.43	0.51	
3c	49.81	6.62	39.70	3.81		
3d	45.82	13.71	36.46	4.01		
3e	44.18	15.65	35.08	5.09		
3f	39.34	22.44	31.20	7.02		
3g	35.61	16.41	43.27	4.71		

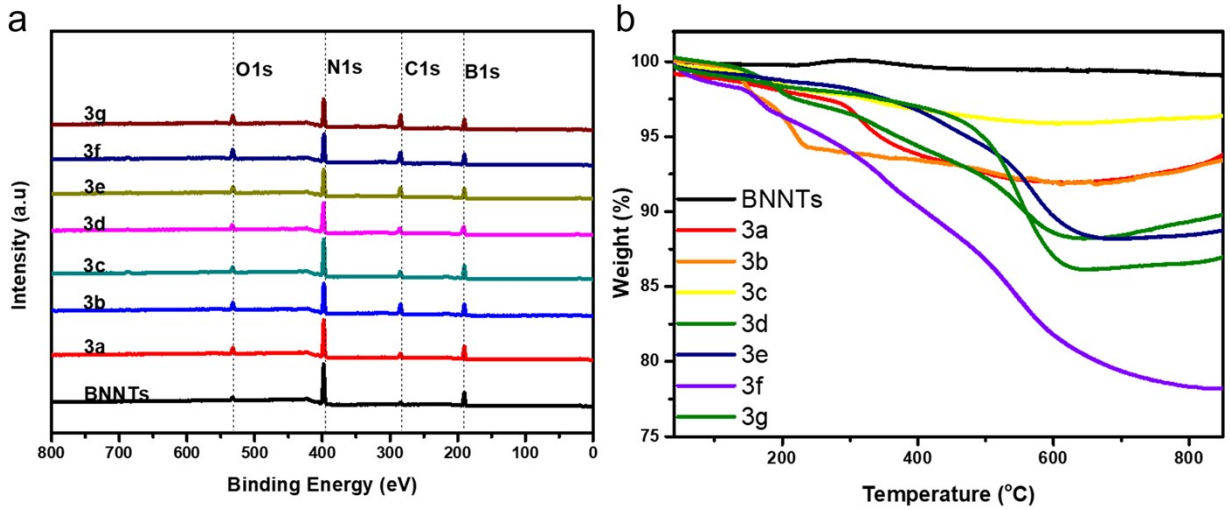
Supporting Table 4. Weight loss (%) of sample 3a – 3g

Sample	Weight loss (%)
3a	8.1
3b	8.2
3c	4.1
3d	11.8
3e	11.8
3f	21.8
3g	13.9

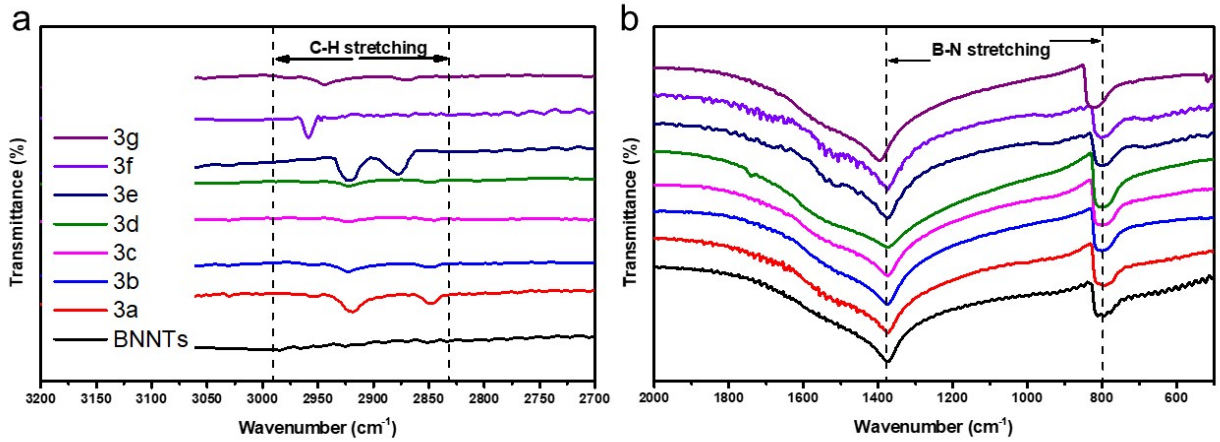
Supporting Figure 1: SEM of BNNTs, 3a-3g proved the stability of nanotubes after the reaction.



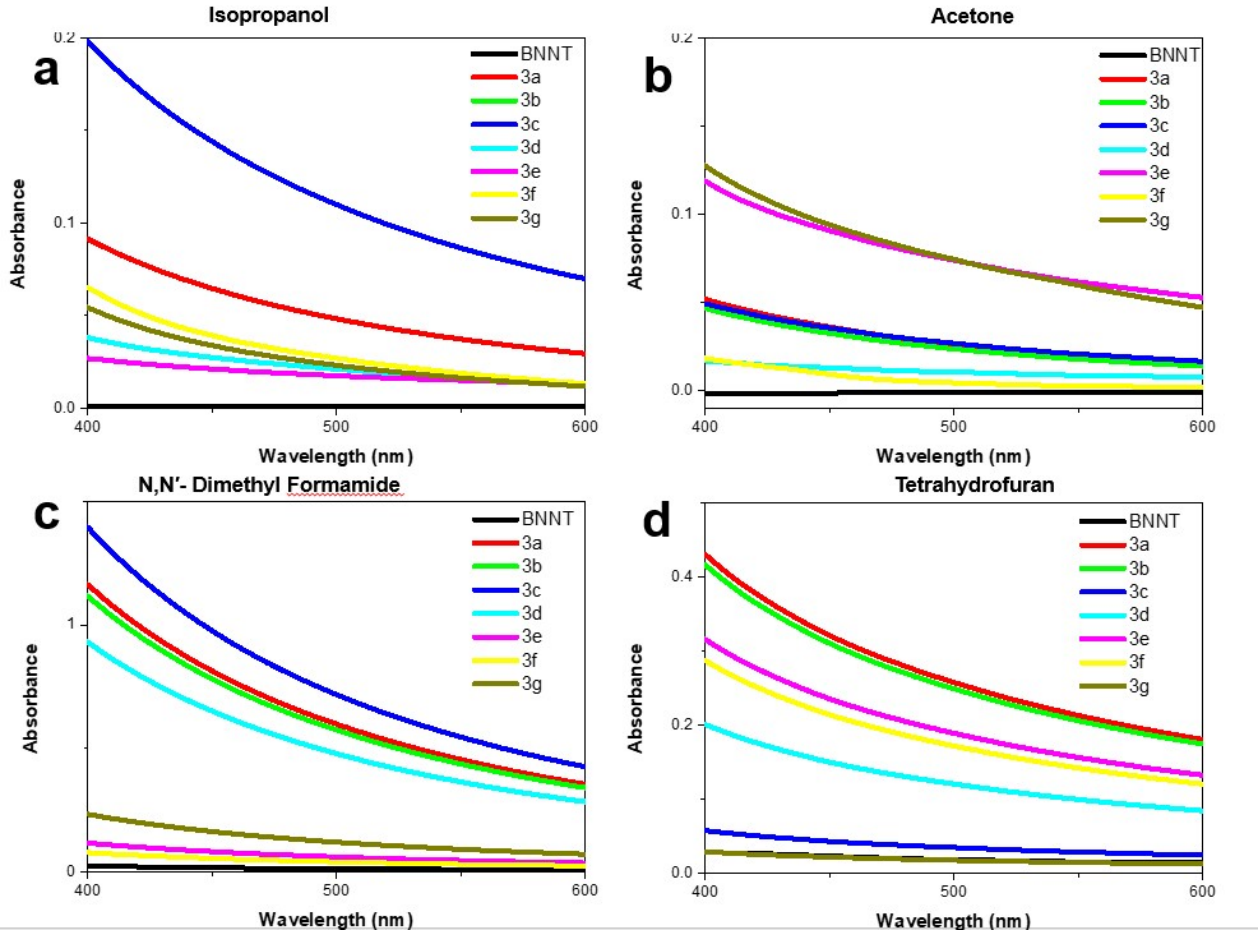
Supporting Figure 2 XPS TGA of sample 3a-3f



Supporting Figure 3 FTIR and magnified FTIR of sample 3a-3f



Supporting Figure 4, estimate dispersion by UV spectra of sample 3a-3f, procedure followed by reference[1]



Reference

(1) Lee, S.-H.; Kim, M. J.; Ahn, S.; Koh, B. Purification of Boron Nitride Nanotubes Enhances Biological Application Properties. *Int. J. Mol. Sci.* **2020**, *21* (4), 1529. https://doi.org/10.3390/ijms21041529.