

## Supporting Information

# High-performance Amino-functional Graphene/CNT Aerogel Adsorbent for Formaldehyde Removal from Indoor Air

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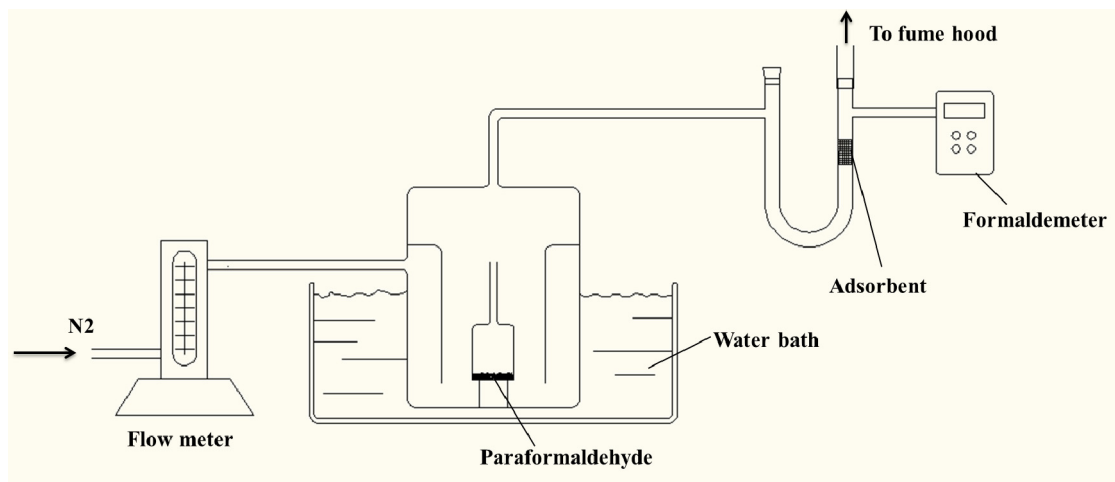


Fig. S1 The scheme of the experimental adsorption device.

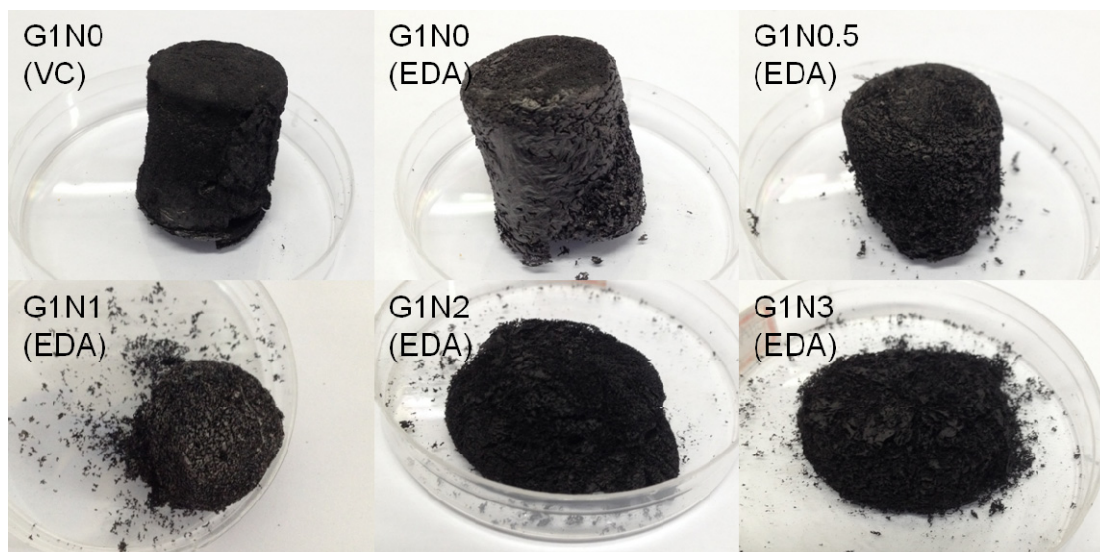


Fig. S2 Optical images of graphene aerogels reduced by ascorbic acid (G1N0 (VC) and ethylenediamine, and samples with different addition amount of CNTs (G1N0, G1N0.5, G1N1, G1N2, G1N3)

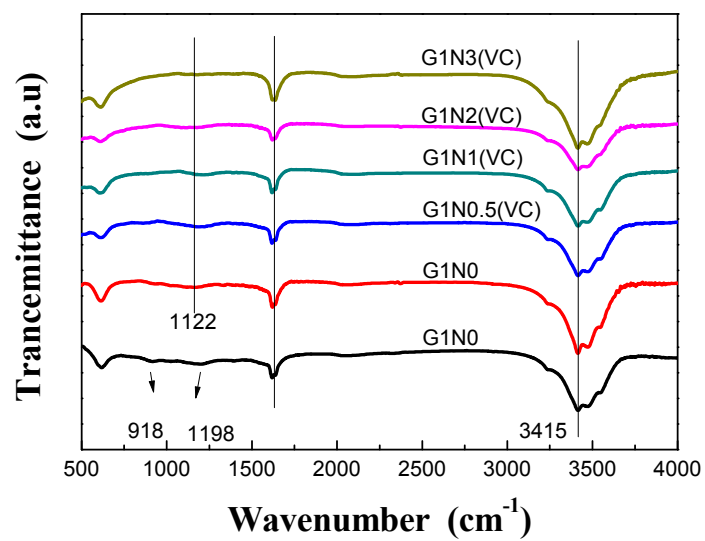


Fig. S3 FTIR spectra of graphene aerogels reduced by ascorbic acid and ethylenediamine, with different additional amount of CNTs

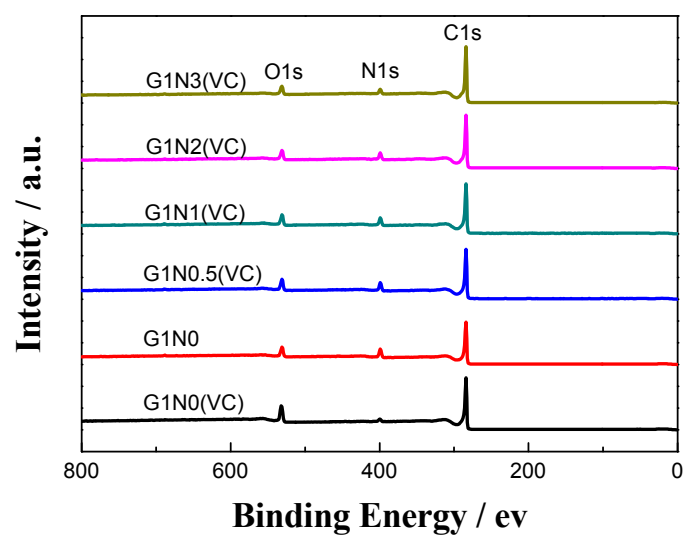


Fig. S4 XPS spectra of graphene aerogels reduced by ascorbic acid and ethylenediamine, with different additional amount of CNTs

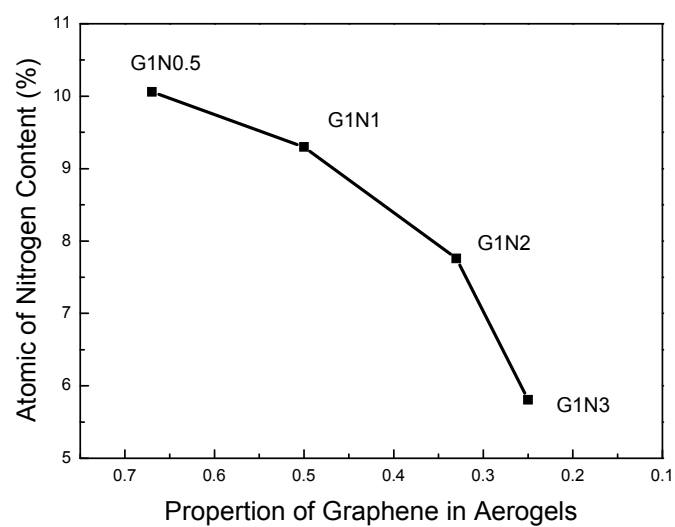


Fig. S5 Variation trend of nitrogen in graphene aerogels with different addition amounts of CNTs.

Table. S1 Adsorption experiment conditions and performance of aerogels

Samples	Nitrogen gas distribution condition (L/min)	Quality of sample (g)	Quality of GO (g)	Quality of CNTs (g)	Practical breakthrough time (min)	Breakthrough time per GO (min)	Adsorption capacity per GO (mg/g)
G1(VC)	0.2	0.1	0.1	0	0	0	0.00
G1N0	0.2	0.1	0.1	0	42	420	0.38
G1N0.5	0.2	0.1	0.067	0.033	168	2507	2.26
G1N1	0.2	0.1	0.05	0.05	357	7140	6.43
G1N2	0.2	0.1	0.033	0.067	609	18455	16.62
G1N3	0.2	0.1	0.025	0.075	390	15600	14.05

Table. S2 Adsorption capacity of different adsorbents

Material type	Maximum adsorption capacity(mg/g)	SSA(m <sup>2</sup> /g)	Test condition	Reference
Activated carbon nanofiber	15.60	1250	the standard formaldehyde gas is 22ppm. Room temperature. The breakthrough time was defined as the time at which the output formaldehyde concentration reaches 1% of the inlet one, that is, 0.22 ppm.	(Lee et al., 2010)
activated carbon	422.90	1084	HCHO concentrations ranged from 0 to 32.5 ppm. A constant temperature bath maintained the sample at 26°C for the remainder of the experimental run.	(Carter et al., 2011)
Silylated GO	96.0	-----	The initial concentration of formaldehyde was 2.14 ppm. Reaction time is 4 days.	(Matsuo et al., 2008)
MOF	1.12×10 <sup>-4</sup>	-----	The effect of the amount of MOF-5 was investigated using 28 µg m <sup>-3</sup> formaldehyde with a sampling flow rate of 50 mL min <sup>-1</sup> and a sampling time of 10 min. The lowest flow rate of 25 mL min <sup>-1</sup> gave the widest linear range from 0.25 to 1.5 L and the highest collection efficiency of formaldehyde,	(Gu et al., 2010)



**References:**

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