

## *Supporting Information*

# Enhanced room temperature ammonia gas sensing based on multichannel PSS-functionalized graphene/PANI network

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To investigate the effect of the aniline concentration on their morphology, PSS-rGO/PANI-0.2, PSS-rGO/PANI-0.15, PSS-rGO/PANI-0.1, and PSS-rGO/PANI-0.05 nanocomposites were obtained by increasing the amount of aniline. Fig. S1 shows the SEM images of PSS-rGO/PANI-0.2, PSS-rGO/PANI-0.15, PSS-rGO/PANI-0.1, and PSS-rGO/PANI-0.05 nanocomposites.

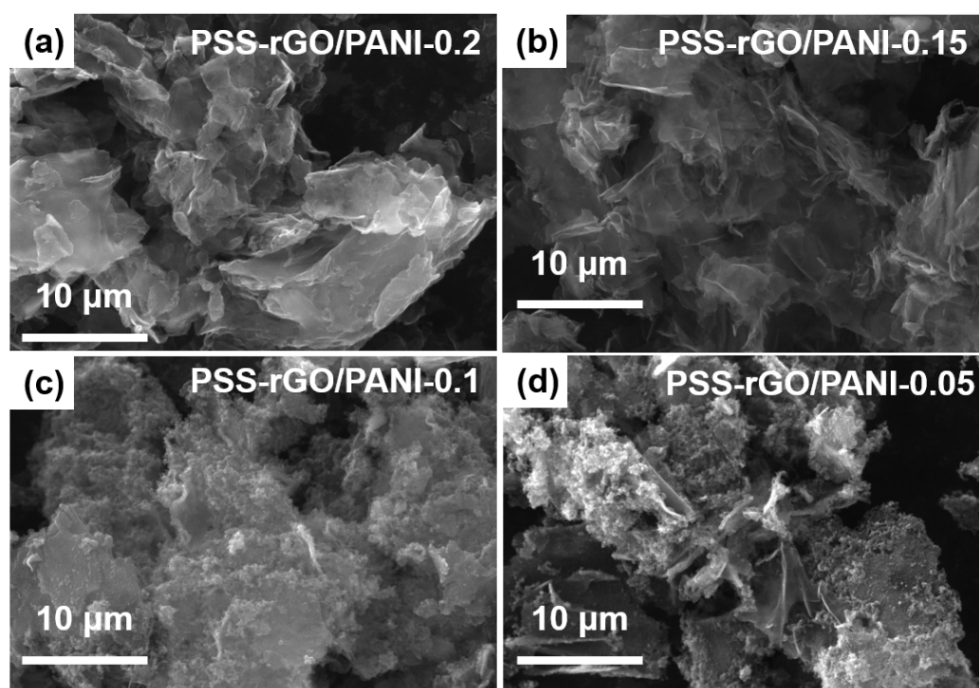


Fig. S1. SEM images of (a) PSS-rGO/PANI-0.2, (b) PSS-rGO/PANI-0.15, (c) PSS-rGO/PANI-0.1 and (d) PSS-rGO/PANI-0.05.

Furthermore, to highlight the importance of the freeze-drying process on their morphology, NoF-PSS-rGO/PANI-0.5, NoF-PSS-rGO/PANI-1, NoF-PSS-rGO/PANI-2, and NoF-PSS-rGO/PANI-4 nanocomposites were obtained by using the NoF-PSS-rGO. Fig. S2 shows the SEM images of NoF-PSS-rGO/PANI-0.5, NoF-PSS-rGO/PANI-1, NoF-PSS-rGO/PANI-2, and NoF-PSS-rGO/PANI-4 nanocomposites.

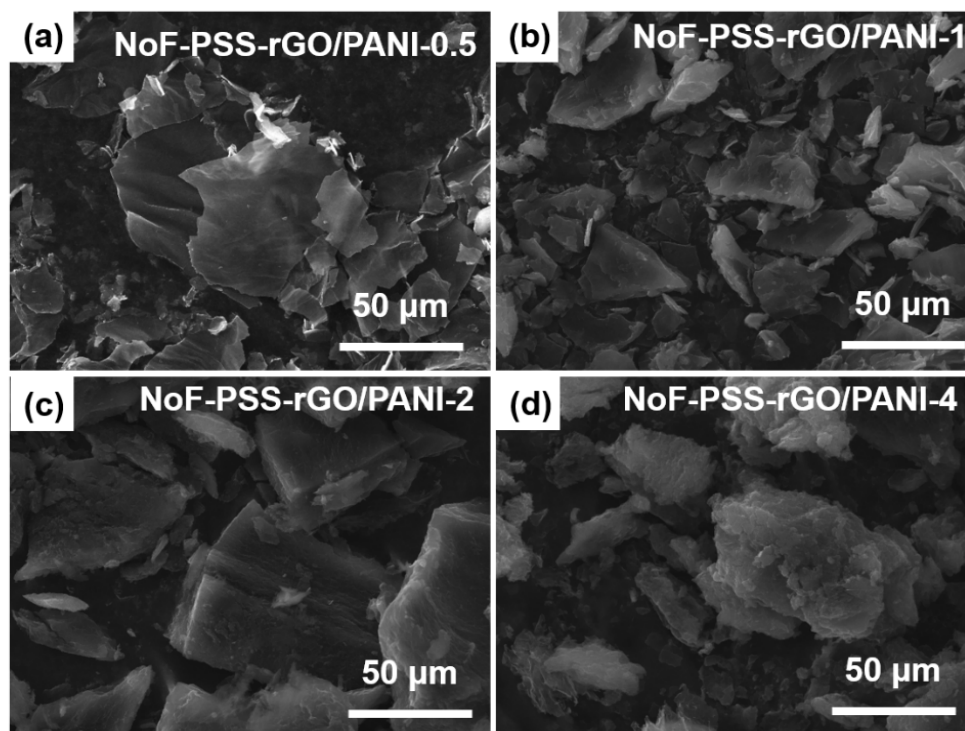


Fig.S2. SEM images of (a) NoF-PSS-rGO/PANI-0.5, (b) NoF-PSS-rGO/PANI-1, (c) NoF-PSS-rGO/PANI-2 and (d) NoF-PSS-rGO/PANI-4.

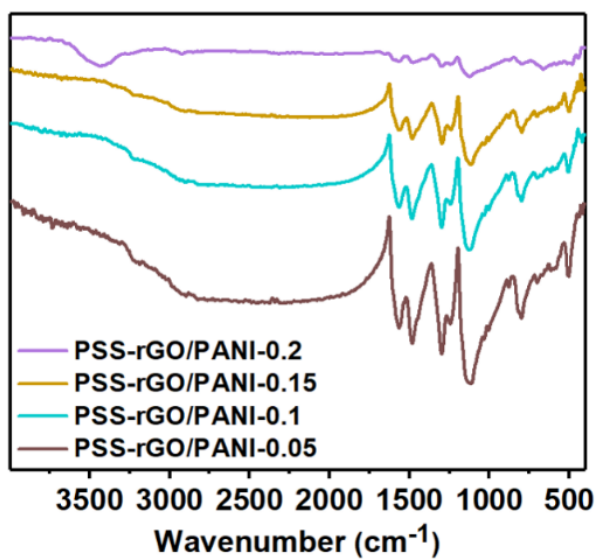


Fig.S3. FTIR spectra of PSS-rGO/PANI-0.2, PSS-rGO/PANI-0.15, PSS-rGO/PANI-0.1 and PSS-rGO/PANI-0.05.

Table S1 XPS analysis of PANI and PSS-rGO/PANI-2

Sensing materials	C 1s (Atomic %)	O 1s (Atomic %)	N 1s (Atomic %)	S 2p (Atomic %)
PANI	80.78	12.61	6.06	0.54
PSS-rGO/PANI- 2	72.74	16.78	6.15	4.33

Table S2 Fitting ratios of N 1s spectra in PANI and PSS-rGO/PANI-2

Name	Peak BE	Atomic % (PANI)	Peak BE	Atomic % (PSS-rGO/PANI-2)
-N= (%)	398.7	35.43	398.5	29.05
-NH-(%)	399.4	40.05	399.2	33.63
N <sup>+</sup> (%)	400.0	24.52	400.5	37.32