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CORRECTION

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Correction: Graphene materials as a superior platform for advanced sensing strategies against gaseous ammonia

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Correction for 'Graphene materials as a superior platform for advanced sensing strategies against gaseous ammonia' by Kumar Vikrant *et al.*, *J. Mater. Chem. A*, 2018, **6**, 22391–22410.

The authors regret the following errors in the original manuscript.

(1) Table 1 and the related discussion contains some errors in the values presented. The corrected version of Table 1 and the corrected sentences are shown here.

Page 7 (left column): These graphene sheets were further transferred onto a silica insulator to showcase a good NH_3 sensing capability (detection limit (DL) of 250 ppm with 500 s response time)[66] (Table 1).

Page 7 (left column): In a similar approach, controlled CVD-grown graphene sheets showcased a DL of 0.5 ppm for gaseous NH_3 under ambient conditions with good reversibility by desorbing the adsorbed species at 200 °C under vacuum *via* a hot plate (Fig. 4).[39]

Page 7 (left column): Interestingly, NSM graphene showcased better sensitivity and performance (DL of 1 ppm with 300 s response time) compared to double layer graphene and more stacked, few-layer types of graphene sensors (Table 1) (Fig. 5).

Page 8 (left column): Ti/Gr showcased good performance (DL of 18 ppm with 150 s response time) ascribed to the catalytic synergistic effect between graphene and naturally produced TiO_x[72] (Table 1).

Page 8 (right column): In a similar approach, a mica-supported graphene-based detector was observed to perform well (DL of 20 ppm with 60 s response time) for gaseous NH_3 sensing with an enhanced sensitivity, which can be attributed to the higher p-doping induced in the graphene framework by mica (Table 1).[72,76]

Page 8 (right column): The P-GNS-400 displayed good performance (DL of 1 ppm with 134 s response time) toward NH_3 sensing, which may be attributed to the presence of electron rich phosphorus species (Table 1).[78]

Page 8 (right column): The GMHW showcased excellent performance (a DL of 0.3 ppm with a 0.4 s response time) to support the great potential of such a sensing method (Table 1).[81]

Page 9 (right column): A graphene/PANI nanocomposite was synthesized for effective sensing of gaseous NH3 (DL of 1 ppm with 50 s response time) (Table 1).[28]

Page 9 (right column): In light of these factors, GO, ZnO, and PANI were synergistically combined to obtain hybrid layer-by-layer films (PANI/GO/PANI/ZnO LbL) for effective sensing of gaseous NH_3 (DL of 23 ppm with 30 s response time) (Table 1).[22]

Page 10 (left column): An inexpensive and highly flexible polymer polyethylene terephthalate (PET) was used as a substrate to synthesize an rGO-PANI loaded hybrid gaseous NH_3 sensor (a DL of 100 ppm with a 20 s response time) (Table 1).[95]

Page 10 (left column): The developed system demonstrated a fairly average performance compared to other sensors (a DL of 50 ppm with a 1080 s response time) (Table 1).

Page 10 (left column): For sensing applications, PET was used as a substrate to fabricate graphene quantum dots (tied edge graphene sheets with a lateral size ≤100 nm) doped with N and S (S,N-GQD/PANI; a DL of 0.5 ppm with a 115 s response time).

Page 10 (right column): Cobalt (Co(II) ion) bearing tetra-baminephthalocyanine, coupled covalently with GO, was applied for sensing gaseous NH_3 with a DL of 0.8 ppm (Table 1) (Fig. 10).[102]

Page 10 (right column): The fluorination method was utilized to insert fluorine atoms onto the GO surface to form f-GO sensors for gaseous NH_3 (DL of 100 ppm) (Table 1).[45]

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Table 1 Application of graphene-based sensors for gaseous NH_3

Order	Graphene-based material	Detection limit		Response time (s)	Reference
		Raw information	In ppm		
1	CVD synthesized graphene	250 ppm	250	500	66
2	CVD synthesized graphene	500 ppb	0.5	—	39
3	NSM graphene	1 ppm	1	300	25
4	Ti/Gr	18 ppm	18	150	9
5	TiO_2/PPy-GN	1 ppm	1	36	41
6	Graphene/mica	20 ppm	20	60	76
7	NO_2-doped graphene	1 400 ppb	1.4	—	44
8	Graphene/Au NP	6 ppm	6	—	40
9	GMHW	0.3 ppm	0.3	0.4	81
10	P-GNS-400	1 ppm	1	134	78
11	PANI/GO/PANI/ZnO LbL film	23 ppm	23	30	22
12	rGO-PANI hybrid loaded PET film	100 ppm	100	20	95
13	S,N-GQD/PANI	500 ppb	0.5	115	43
14	rGO-PANI	50 ppm	50	1080	96
15	Graphene/PANI	1 ppm	1	50	28
16	aPcM-GO	800 ppb	0.8	—	102
17	f-GO	100 ppm	100	—	45
18	PEDOT-PSS/GO	1 ppm	1	95	107
19	rGO	430 ppb	0.43	—	151
20	rGO	1 ppm	1	1.4	111
21	rGO/Ag	—	—	10	113
22	NiPc/rGO	800 ppb	0.8	200	116
23	ZnO-rGO	500 ppb	0.5	50	117
24	PPy/rGO	1 ppm	1	—	23
25	rGO/AgNW	15 ppm	15	60	114
26	rGO/P3HT	10 ppm	10	141	123
27	ZnO/rGO	10 ppm	10	78	133
28	PMMA/rGO	10 ppm	10	60	26
29	Pd/SnO_2/rGO	5 ppm	5	420	125
30	Pd NP/TiO_2 MR/RGO film	2.4 ppm	2.4	184	57
31	ZnO NW-RGO	1 ppm	1	50	25
32	rGO/TBPOMPc	0.3 ppm	0.3	—	37
33	RGO/3-CuPc	400 ppb	0.4	—	42
34	Cu_2O nanorod/rGO	100 ppm	100	28	119
35	rGo/SnO_2-nanorod	200 ppm	200	8	121

Page 10 (right column): The PEDOT-PSS GO sensors displayed relatively enhanced sensitivity but with a rather slow response (a DL of 1 ppm with a 95 s response time) in the presence of common volatile gaseous pollutants such as ethanol, methanol, propanol, acetone, and chlorobenzene[107] (Table 1).

Page 11 (left column): GO can be reduced chemically *via* a pyrrole to make rGO-based sensors with good performance and selectivity toward gaseous NH_3 (a DL of 1 ppm with a 1.4 s response time) (Table 1).[111]

Page 11 (right column): In a similar approach, rGO nanosheets were coated onto Ag nanowires (rGO/AgNWs) to fabricate sensors for effective detection of gaseous NH_3 with good stability and recovery (a DL of 15 ppm with a 60 s response time) (Table 1).[114]

Page 11 (right column): Tetra-α-iso-pentyloxyphthalocyanine nickel (NiPc) was synergistically combined with rGO to fabricate sensors for gaseous NH_3 detection with a DL of 0.8 ppm (a response time of 200 s) (Table 1).[116]

Page 12 (left column): ZnO nanowires were also combined with rGO for detection of gaseous NH_3 (a DL of 0.5 ppm with a 50 s response time) (Table 1).[117]

Page 12 (left column): Likewise, Cu_2O nanorods were synergistically combined with rGO to effectively detect gaseous NH_3 with good sensitivity at room temperature (a DL of 100 ppm with a 28 s response time)[119] (Table 1).

Page 12 (left column): Similarly, SnO_2 nanorods were synergistically combined with rGO to effectively detect gaseous NH_3 (a DL of 200 ppm with an 8 s response time) at room temperature with good sensitivity[121] (Table 1).

Page 12 (right column): Polypyrrole (PPy) was anchored on the surface of rGO nanosheets to fabricate a PPy/rGO hybrid composite sensor for gaseous NH_3 detection (a DL of 1 ppm) (Table 1).[23]

Page 12 (right column): Poly (3-hexylthiophene) was coupled with rGO to form nanocomposite (rGO/P3HT) sensors for gaseous NH_3 detection (a DL of 10 ppm with a 141 s response time) with appreciable selectivity in the presence of interfering substances like CO_2, CO, SO_2, and NO_2 (ref. 123) (Table 1).

Page 12 (right column): A ternary nanocomposite film sensor, synergistically combining Pd, SnO_2, and rGO (Pd/SnO_2/rGO), was developed for effective detection of gaseous NH_3 (a DL of 5 ppm with a 420 s response time) (Table 1).[125]

Page 13 (right column): This ternary sensor showed sensing performance for gaseous NH_3 (a DL of 2.4 ppm with a 184 s response time) at room temperature with great stability, sensitivity, and selectivity (Table 1).[57]

Page 13 (right column): This nanocomposite sensor displayed good performance for NH_3 sensing (a DL of 0.05 ppm with a 50 s response time) at room temperature with good recovery (Table 1).[37]

Page 13 (right column): This sensor showed average detection capability for gaseous NH_3 (a DL of 0.4 ppm) with good reversibility and selectivity in the presence of H_2, CH_4, CO, and CO_2 (Fig. 14(b)) (Table 1).[42]

Page 14 (left column): In this regard, poly(methyl methacrylate) was coupled with rGO to form nanocomposites (PMMA/rGO) for effective detection of gaseous NH_3 based on SPR technology (a DL of 10 ppm with a 60 s response time)[26] (Table 1).

Page 14 (right column): The lowest detection limit of 0.3 ppm was reported amongst the graphene-based systems using the GMHW and rGO/TBPOMPc[37,81] (Table 1).

(2) Table 2 and the related discussion contains some errors in the values presented. The corrected version of Table 2 and the corrected sentences are shown here.

Page 14 (right column): For other advanced nanostructures, the lowest reported DL was 0.5 ppm for a single wall carbon nanotube-pyrene (SWCNT-pyrene) composite and silica doped CeO_2 (ref. 131 and 132) (Table 2).

Page 15 (left column): In this regard, PANI nanofibers were synergistically combined with WS_2 nanosheets to maximize the sensitivity toward gaseous NH_3 (DL of 50 ppm with 260 s response time)[54] (Table 2).

Page 15 (left column): However, PANI-nanofiber/WS_2 nanosheets displayed poor performance under similar conditions compared to graphene/PANI composites (a DL of 1 ppm with a 50 s response time) (Tables 1 and 2).

Page 15 (left column): On a similar note, cheap and biocompatible ZnO nanospheres with favorable electrical properties were doped with Mn (to increase the amount of surface defects) for effective sensing of gaseous NH_3 (a DL of 20 ppm with a 4 s response time).[134]

Table 2 Application of nanomaterials for gaseous NH_3 sensing

		Detection limit			
Order	Nanomaterial	Raw information	In ppm	Response time (s)	Reference
1	ZnO-PANI	10 ppm	10	21	152
2	PANI-CNT	4 ppm	4	18	153
3	Pd-PANI	10 ppm	10	100	154
4	SWCNT-pyrene	0.5 ppm	0.5	5	131
5	Mn-doped ZnO nanosphere	20 ppm	20	4	134
6	Al–ZnO/CuO	100 ppm	100	14	155
7	Ag/ZnO	10 ppm	10	—	156
8	HCI doped-PANI-nanofiber/WS_2 nanosheet	50 ppm	50	260	54
9	PQT-12/CdSe QD	20 ppm	20	50	157
10	InHCF-NP	3 ppm	3	360	158
11	WS_2/TiO_2 QD	0.8 ppm	0.8	—	159
12	Silica modified-CeO_2	0.5 ppm	0.5	760	132
13	$ZnFe_2O_4$	100 ppm	100	95	160
14	Pt/NiO thin film	10 ppm	10	15	106

The Royal Society of Chemistry apologises for these errors and any consequent inconvenience to authors and readers.