

Supplementary Materials

Room Temperature Ammonia Sensing Using Polyaniline-Coated Laser-Induced Graphene

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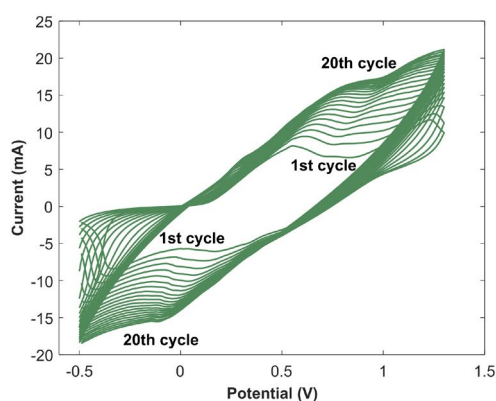


Figure S1. Cyclic voltammograms of the PANI with a scan rate of 50 mV/s for 20 cycles.

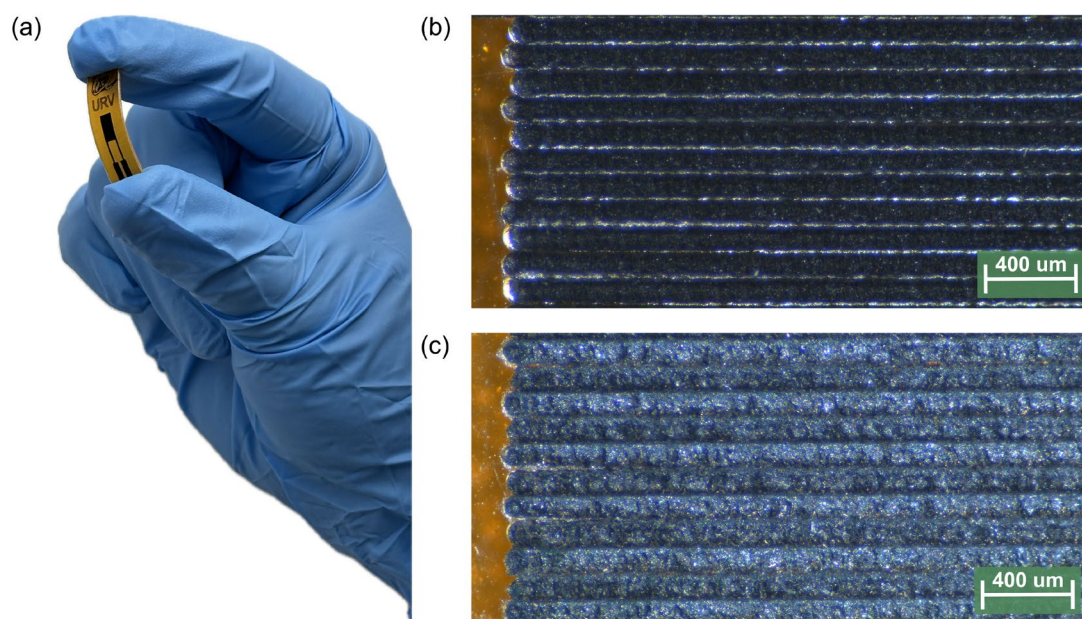


Figure S2. (a) Real picture of the PANI@LIG gas sensor fabricated. Optical images of (b) bare LIG electrode and (c) PANI@LIG gas sensor.

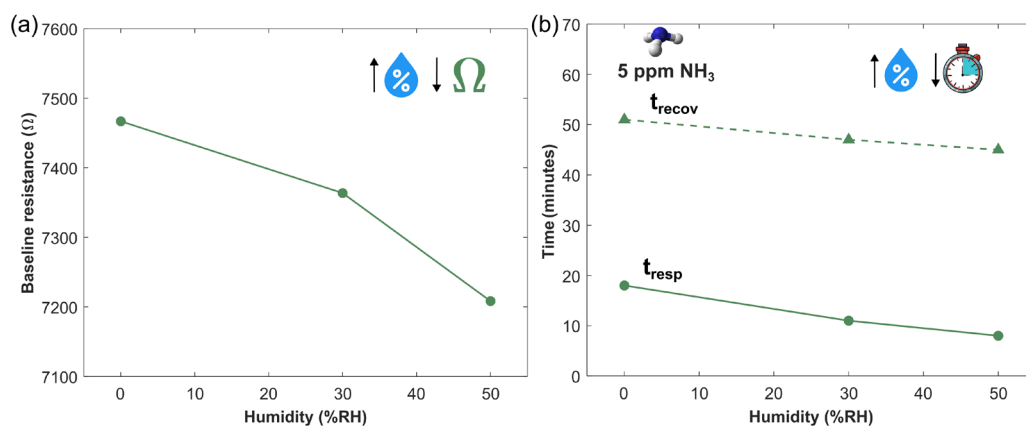


Figure S3. Illustration showing (a) the relationship between sensor baseline resistance and relative humidity, and (b) the correlation between sensor response/recovery times (towards 5 ppm NH₃) and relative humidity.

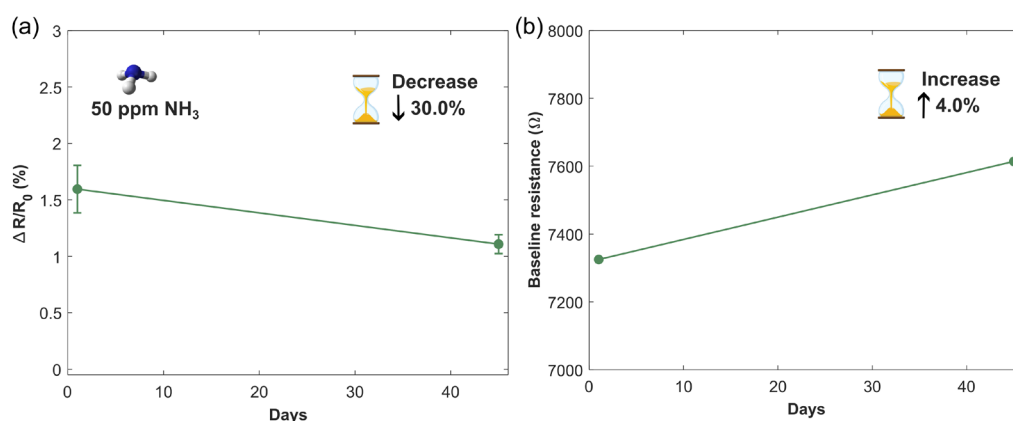


Figure S4. Illustration showing (a) long-term stability study for the sensor responses (5 cycles) towards 50 ppm NH₃ and (b) the evolution of the baseline resistance.

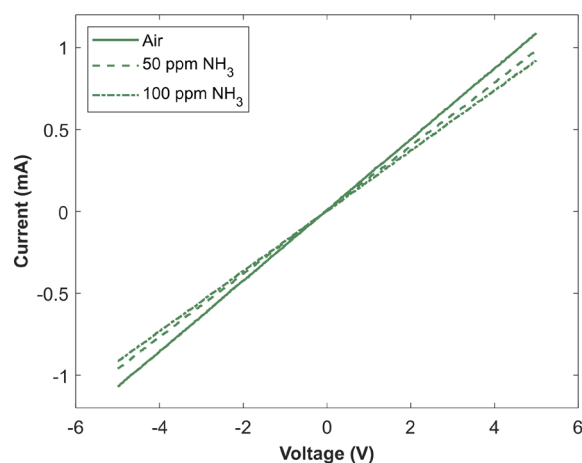


Figure S5. Illustration showing the current-voltage (I-V) characteristics of the gas sensor in air, 50 ppm and 100 ppm NH₃ concentrations.

Table S1 Summary of previous research results for NH₃ sensors operating at room temperature, based on graphene/PANI nanocomposites. G: graphene, PANI: polyaniline, rGO: reduce graphene oxide, GO: graphene oxide

Sensing Material	Polymerization method	Flow (ml/s)	Carrier gas	Humidity (%RH)	Concentration (ppm)	Response (%)	Theoretical LOD (ppm)	Humidity test	Flexible	Reference
3D-rGO/PANI	Electrochemical	-	Air	Dry	5	111	-	No	No	60
N-rGO/PANI	Chemical oxidative	-	-	Ambient	20	200	0.33	Yes	No	86
rGO/PANI	In-situ	-	-	-	100	250	5	No	No	87
rGO/PANI	In-situ	-	-	50	20	30	0.034	Yes	Yes	67
rGO/PANI	In situ	-	-	40	20	1.5	0.046	Yes	No	59
GO/PANI	Ex-situ	-	-	-	5	60	5	No	No	88
GO/PANI	In-situ	-	-	Dry	40	9.6	30	No	No	89
G-PVDF/PANI	In-situ	-	-	70	1	60	0.1	Yes	Yes	68
S, N: GQDs/PANI	/Chemical oxidative	-	Air	57	100	42.3	0.5	Yes	Yes	58
G/PANI	Chemical oxidative	-	N ₂	Dry	20	3.65	1	No	No	56
LIG/PANI	Electrochemical	100	Air	50	100	6.46	0.0024	Yes	Yes	This work

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