Supporting Information

Investigation of the room temperature flexible fiber shape NH_3 sensor based on PANI-Au-SnO_2 compound

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Supporting Information

Fig S1: NH_3 gas sensor detection scheme.

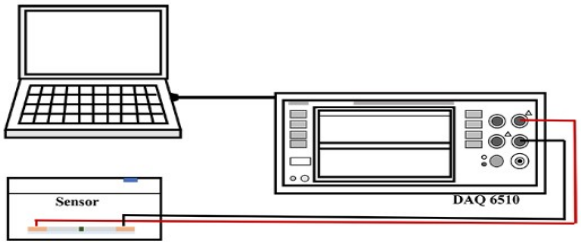

Fig. S1 NH_3 gas sensor detection scheme.

Fig S2: Bending test apparatus.

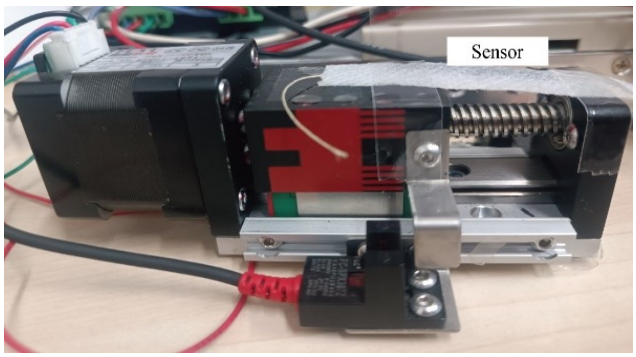

Fig. S2 Bending test apparatus.

Fig S3: NH_3 sensitive material screening: (a-c) 10, 20, 50 nanometers of SnO_2 made of NH_3 sensitive material at 600 ppm responsivity.

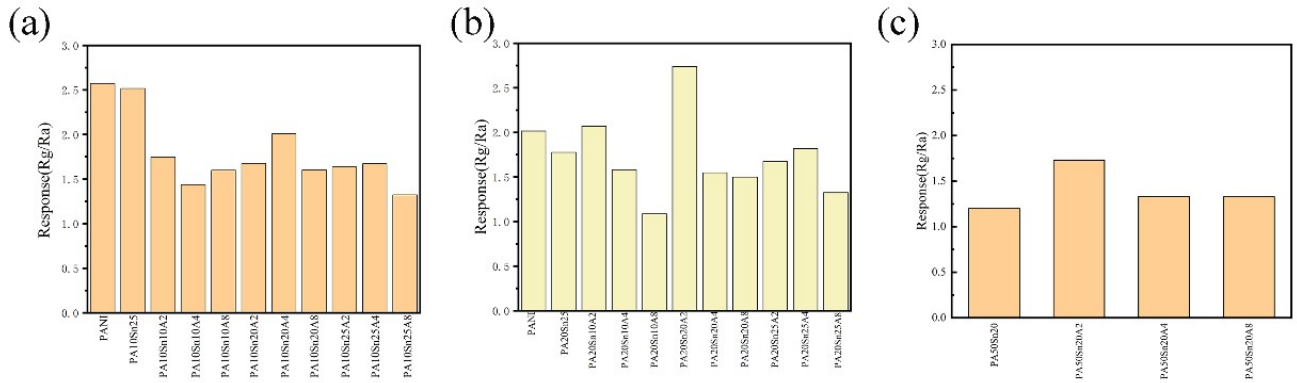

Fig. S3 NH_3 sensitive material screening: (a-c) 10, 20, 50 nanometers of SnO_2 made of NH_3 sensitive material at 600 ppm responsivity.

Fig S4: 20Sn20A2 and PA20Sn20A2 material element analysis.

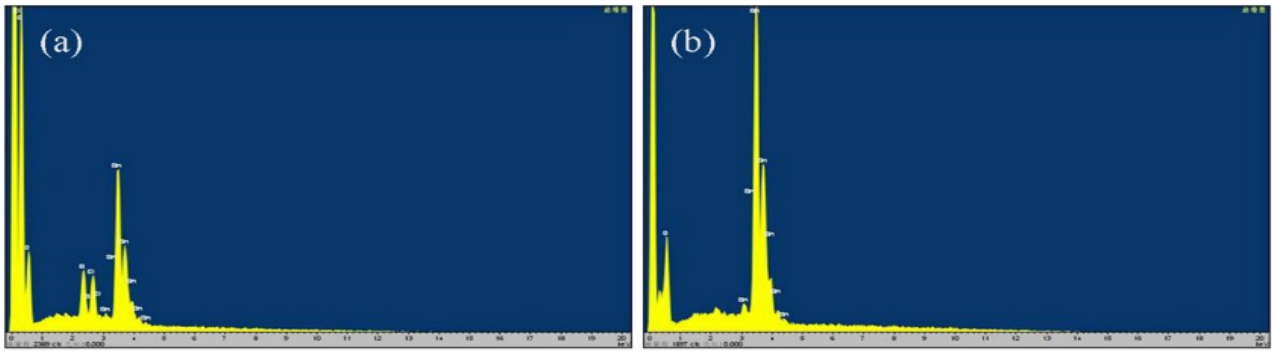

Fig. S 4 20Sn20A2 and PA20Sn20A2 material element analysis.

Fig S5: XPS of PA20Sn10Au2.

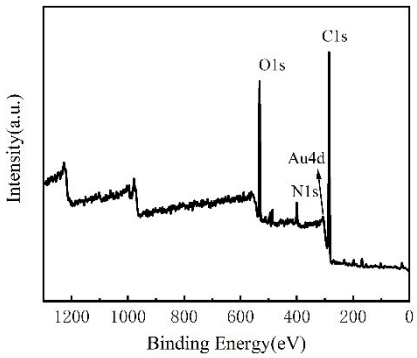

Fig. S5 XPS of PA20Sn10Au2.

Fig S6: SEM of fiber shape NH_3 sensor.

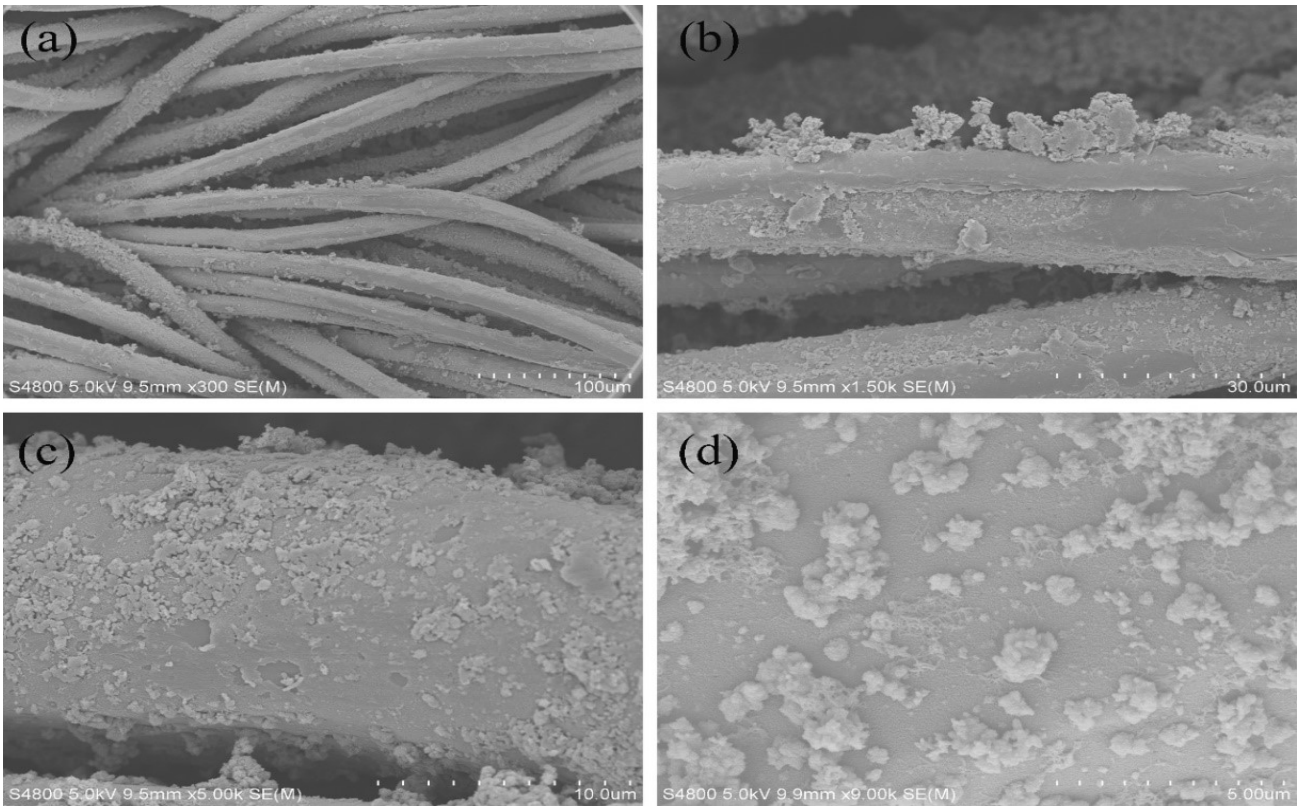

Fig. S6 SEM of fiber shape NH_3 sensor.

Fig S7: SEM of nylon woven fibers.

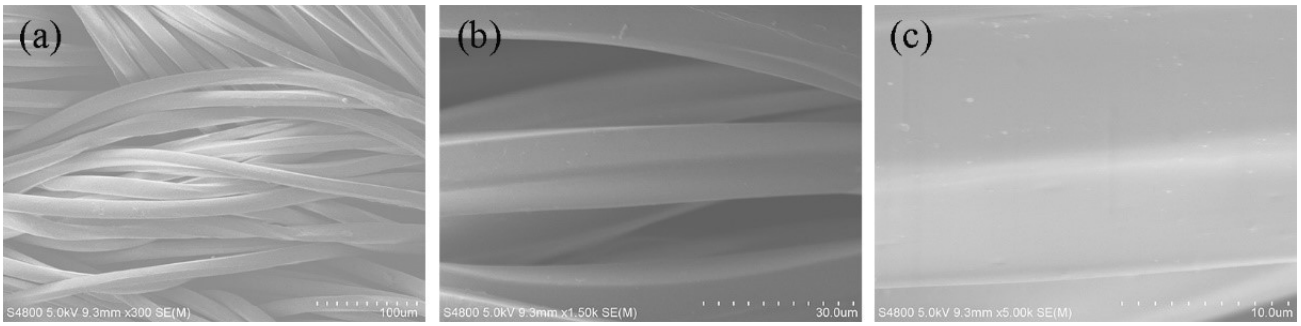

Fig. S7 SEM of nylon woven fibers.

Fig S8: EDS analysis of fiber shape NH_3 sensor.

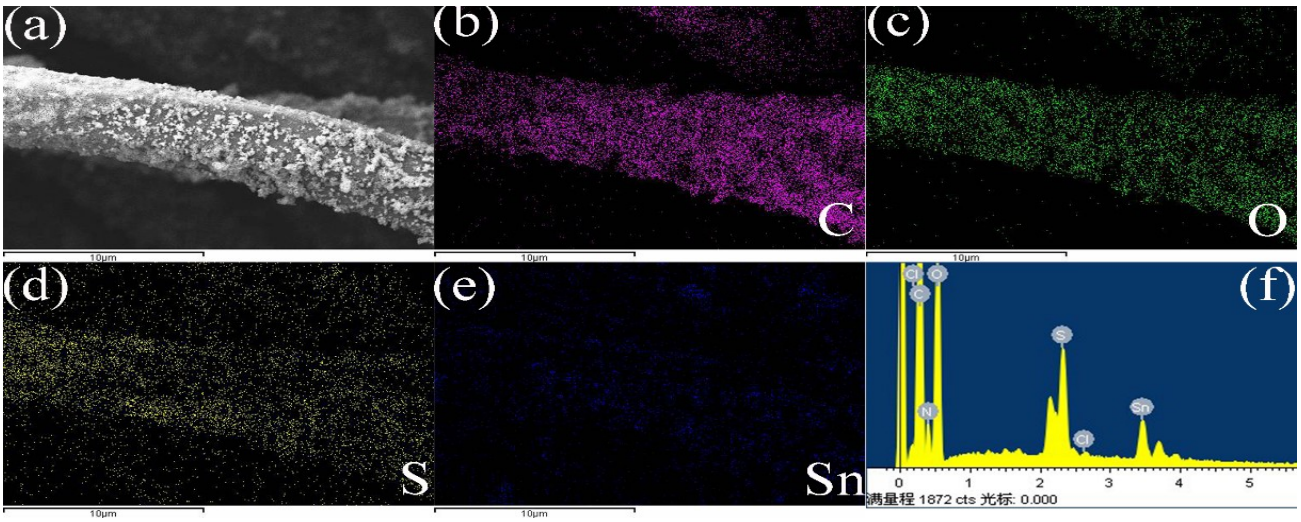

Fig. S8 EDS analysis of fiber shape NH_3 sensor.

Fig S9: (a) Wearable NH_3 monitoring system. (b) The practical application of the hat. (c) Circuit diagram of the hat system.

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Table S1 Elemental energy spectrum analysis of 20Sn20A2.

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Element	Concentration of element	Intensity correction	Percentage by weight	Percentage by weight Sigma	Atomic percent ratio
O K	2.92	0.4260	30.08	0.89	76.14
Sn L	14.20	0.8957	69.92	0.89	23.86
Total			100.00		

Table S2 The content of each element in PA20Sn10Au2.

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element type	element content
C1s	74.196
O1s	20.835
N1s	4.91
Au4d	0.059

Table S3 The performance comparison between the sensor in this paper and the previous work.

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Materials	Substrates	Conc(ppm)	Temp.(◦C)	Response/Recovery time (s)	The formula of response	Response	Ref
PANI-Au-SnO_2	The nylon braided line	20	RT	93/168	R_g/R_a	1.68	This work
NiO-CuO	Poly(para-phenyleneterephthalamide) fibers	200	RT	72.5/35	$\triangle R/R_a$	82%	[1]
CNT-ZnO	commercially available nylon rope	500	RT	-	R_g/R_a	1.2	[2]
MXene-rGO	MXene/rGO hybrid fibers	100	RT	-	$\triangle R/R_a*100\%$	7.21%	[3]
PANI-polyethylene oxide (PEO)-ZnO	PANI/PEO nanofibers	250	RT	245/153	$\triangle R/R_a*100$	60%	[4]
PANI-WO_3	cotton thread	100	RT	122/165	R_g/R_a	2.5	[5]
PANI	Yarn/PS	50	RT	/	$\triangle R/R_a$	57%	[6]

§ RT in the table is 25 ℃. R_g is the resistance value of the sensor after stable contact with the target gas, R_a is the resistance value of the sensor in the air, and $\triangle R$ is the absolute value of the difference between the above two values.

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