Supporting information:

Mesoporous Ni_3N/NiO composite with core-shell structure for room temperature, selective and sensitive NO_2 gas sensing

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Table 1. Summary of the different sample (precursor - $Ni(HCO_3)_2$ or $Ni(OH)_2$) with different Urea:Ni mol ratio, Solvothermal or Hydrothermal temperature, Reaction time and Solution.

Sample	Urea:Ni mol ratio	Solution	Temperature	Reaction time	Products
a	2:1	50 ml H_2O and 30 ml	100 °C	18 h	$Ni(OH)_2$
b	5:1	50 ml H_2O and 30 ml	100 °C	18 h	$Ni(OH)_2$
c	2:1	50 ml H_2O and 30 ml	160 °C	4 h	$Ni(OH)_2$
d	5:1	50 ml H_2O and 30 ml	160 °C	4 h	$Ni(OH)_2$
e	2:1	80 ml H_2O	160 °C	18 h	$Ni(OH)_2$
f	5:1	80 ml H_2O	160 °C	18 h	$Ni(HCO_3)_2$
g	2:1	50 ml H_2O and 30 ml	160 °C	18 h	$Ni(OH)_2$
h	5:1	50 ml H_2O and 30 ml	160 °C	18 h	$Ni(HCO_3)_2$

Figure S1. Schematic illustration of the homemade gas mixing line for sensor testing system.

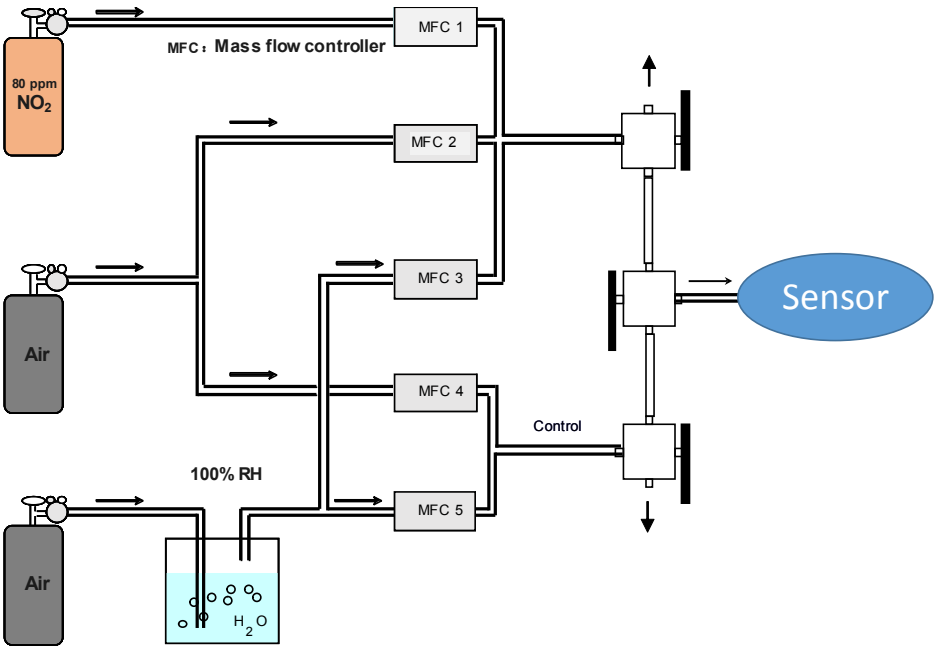

Figure S2. XRD patterns of $Ni(OH)_2$ (sample a-e and g listed in table1).

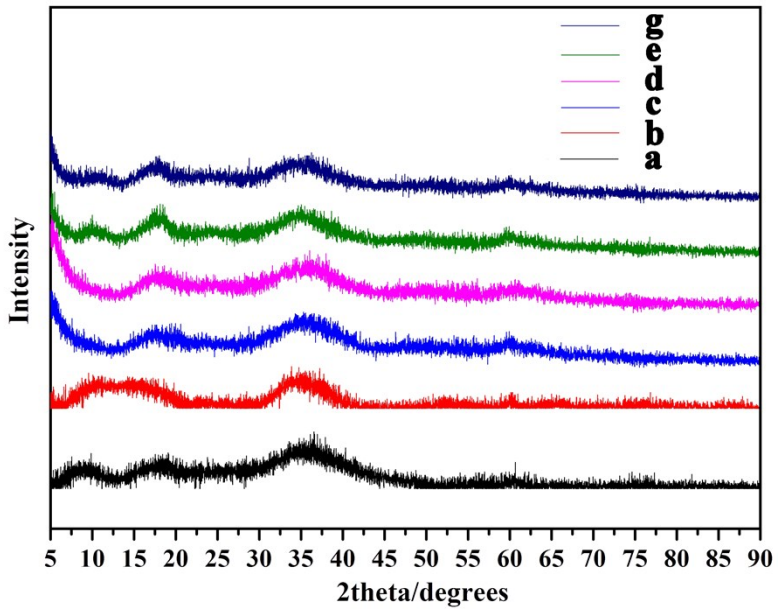

Figure S3. XRD patterns of $Ni(HCO_3)_2$ (sample f and h listed in table 1).

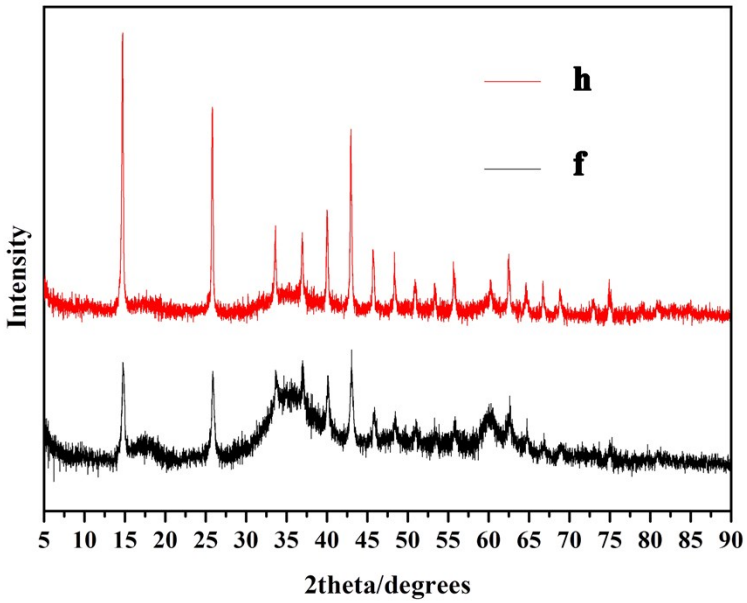

Figure S4. Refinement of PXRD of Ni_3N composite.

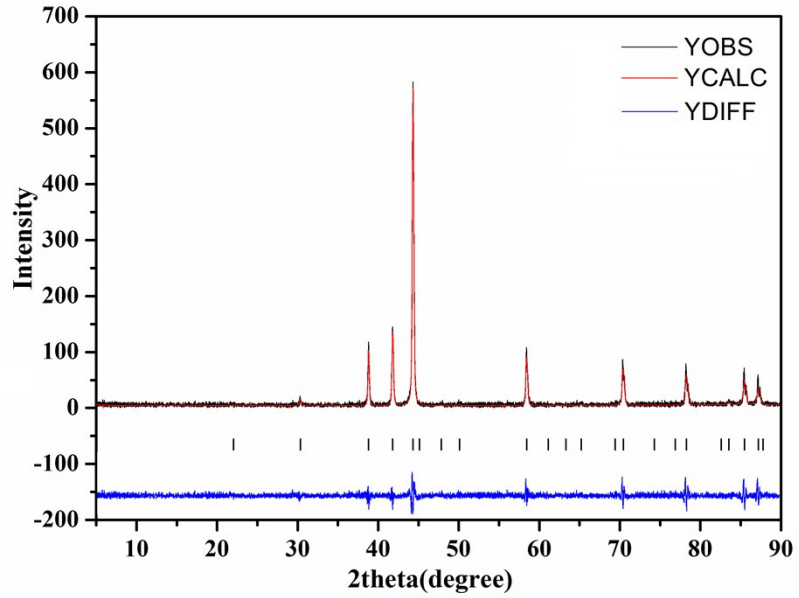

Figure S5. SEM images of $Ni(OH)_2$ sample a-e and g (corresponded to images a-h) and $Ni(HCO_3)_2$ sample f and h (corresponded to images f and h) listed in table1.

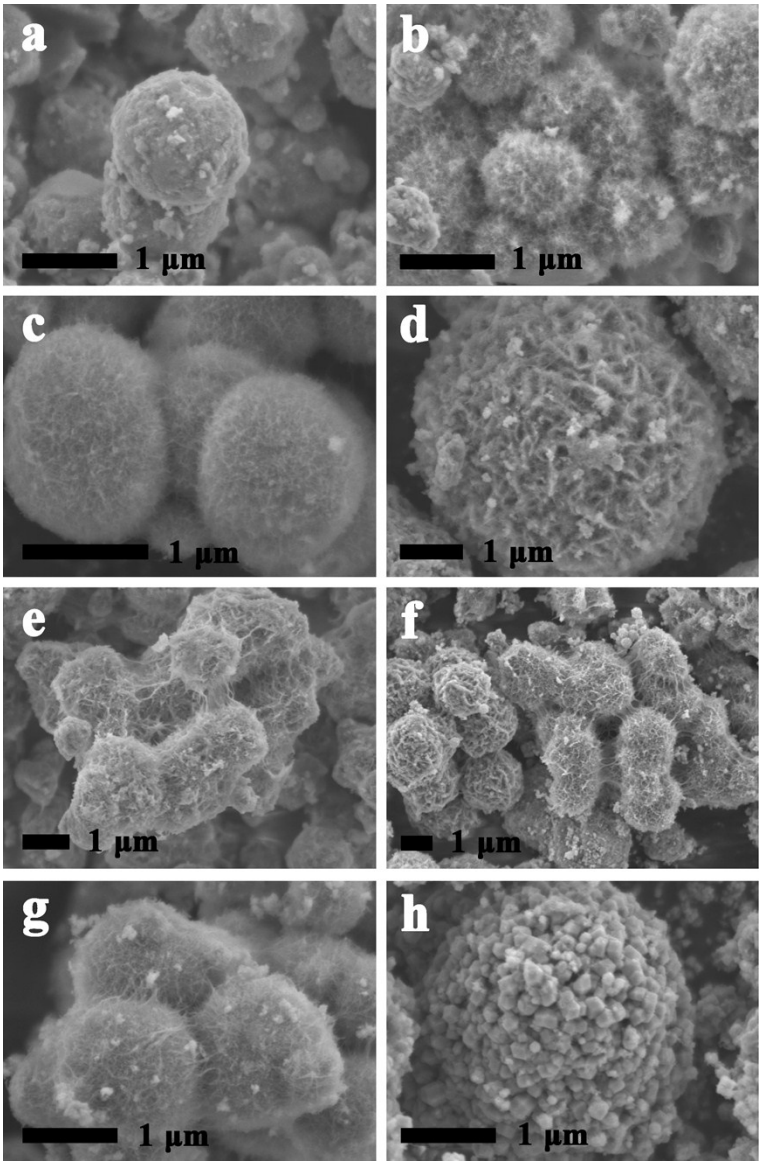

Figure S6. The self-life of Ni_3N/NiO-based sensor for 2 ppm NO_2 sensing at room temperature for two weeks.

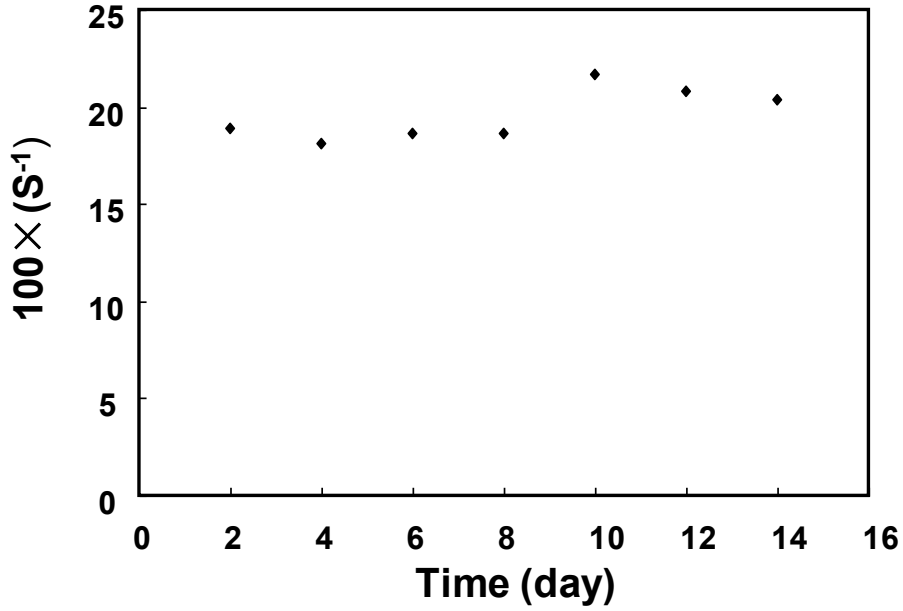

Figure S7. The room temperature sensing properties for Ni_3N, NiO, and Ni_3N/NiO mixture-based sensors to 2 ppm NO_2.