

Fe₃O₄/rGO Nanocomposite: Synthesis and Enhanced NO_x Gas-Sensing Properties at Room Temperature

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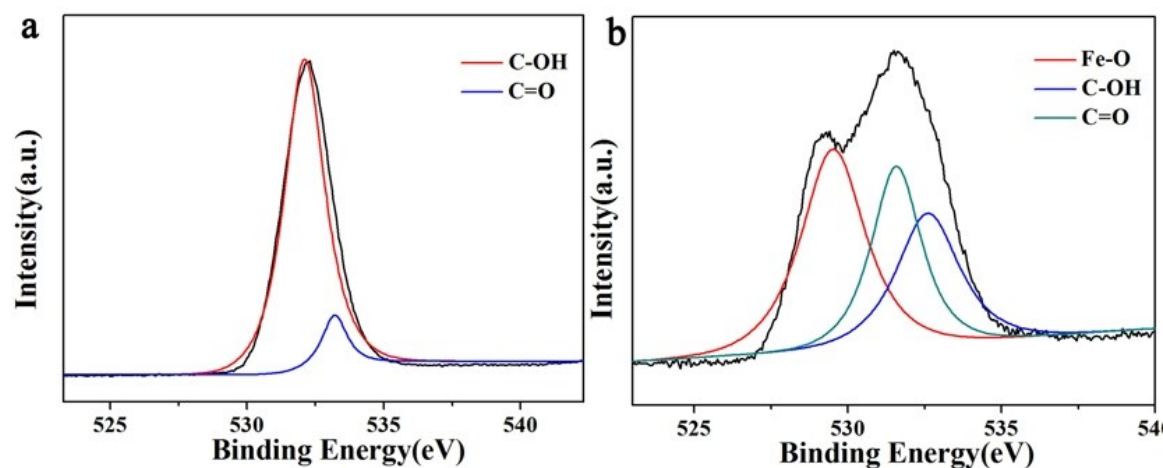


Fig. S1 XPS spectra of O 1s (a) GO (b) Fe/rGO2-400.

Tab.S1 The results of the surface area, pore volume and pore size for Fe₃O₄/rGO1-400,

Fe₃O₄/rGO2-400, Fe₃O₄/rGO3-400 and Fe₃O₄.

Sample	S _{BET} (m ² .g ⁻¹) 1)	pore volume (cm ³ .g ⁻¹)	pore size (nm)
Fe ₃ O ₄	57.13	0.35	23.01
Fe ₃ O ₄ /rGO1-400	79.61	0.30	14.29
Fe ₃ O ₄ /rGO2-400	160.39	0.39	8.87
Fe ₃ O ₄ /rGO3-400	172.03	0.27	7.46

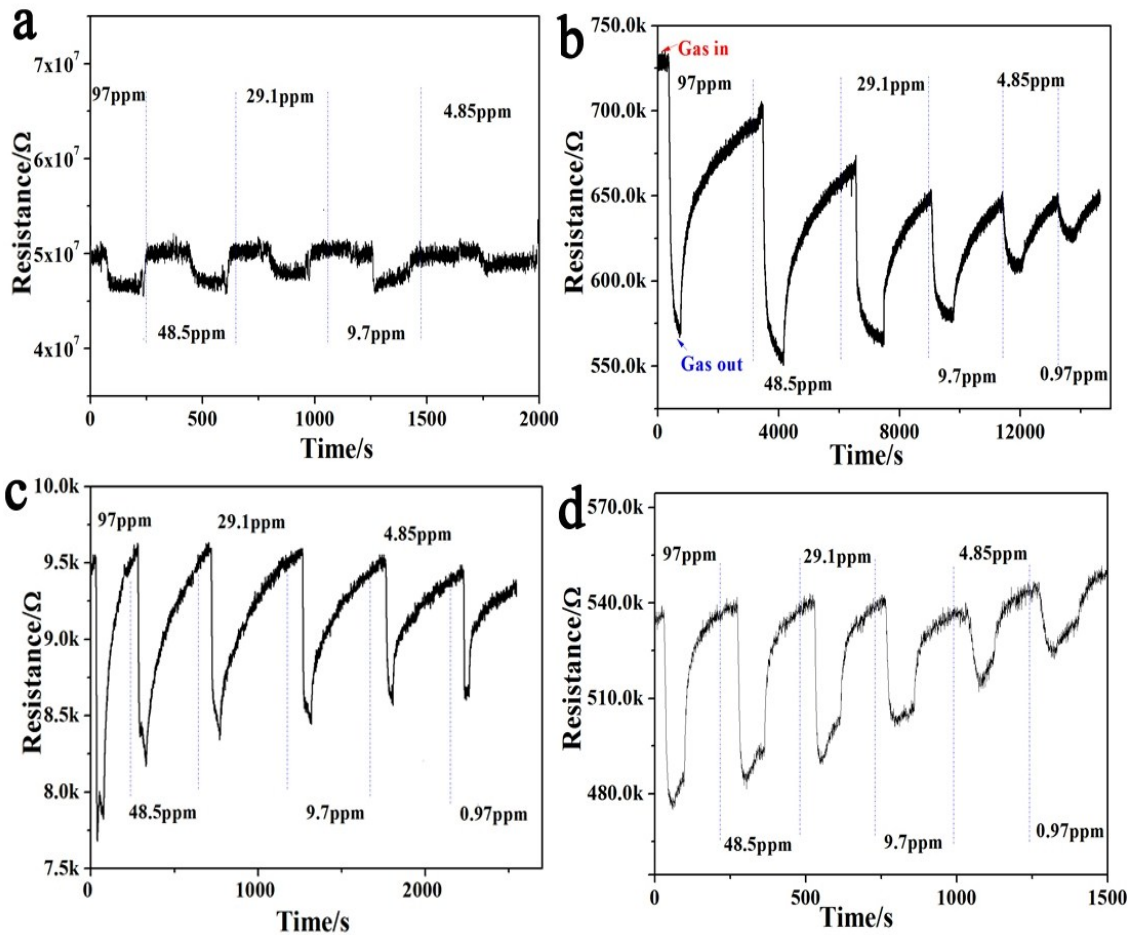


Fig. S2 The representative response-recovery cyclic curves of the gas response for Fe₃O₄/rGO1-400, Fe₃O₄/rGO3-400, Fe₃O₄/rGO4-400 and Fe₃O₄ sensor to 97.0 ppm~0.97 ppm NO_x operated at room temperature in air.

Tab. S2 The results of the gas response of Fe₃O₄/rGO1-400, Fe₃O₄/rGO2-400, Fe₃O₄/rGO3-400, Fe₃O₄/rGO3-400, Fe₃O₄/rGO4-400 and Fe₃O₄ sensor to 97.0 ppm~0.97 ppm NO_x operated at RT.

sample	Sensitivity (%)					
	97.0 ppm	48.5 ppm	29.1 ppm	9.70 ppm	4.85 ppm	0.97 ppm
Fe ₃ O ₄	4.9	4.7	4.0	5.3	3.6	--
Fe ₃ O ₄ /rGO1-400	21.4	20.5	15.4	11.4	5.6	2.7
Fe ₃ O ₄ /rGO2-400	35.6	30.2	29.7	20.7	13.1	10.3
Fe ₃ O ₄ /rGO3-400	17.0	13.9	11.9	11.2	8.7	7.6
Fe ₃ O ₄ /rGO4-400	10.0	9.4	8.7	6.9	4.0	3.1

Tab.S3 The results of the gas response time of Fe₃O₄/rGO1-400, Fe₃O₄/rGO2-400, Fe₃O₄/rGO3-400, Fe₃O₄/rGO4-400 and Fe₃O₄ sensor to 97.0 ppm~0.97 ppm NO_x operated at RT.

sample	Response time (s)					
	97.0 ppm	48.5 ppm	29.1 ppm	9.70 ppm	4.85 ppm	0.97 ppm
Fe ₃ O ₄	23.0	44.0	46.3	15.3	36.6	--
Fe ₃ O ₄ /rGO1-400	75.0	106.0	201.3	240.6	280.3	300.7
Fe ₃ O ₄ /rGO2-400	29.3	32.3	54.5	84.6	85.1	106.4
Fe ₃ O ₄ /rGO3-400	14.7	16.7	17.3	17.3	21.3	26.0
Fe ₃ O ₄ /rGO4-400	13.7	12.7	15.3	18.6	33.0	36.7

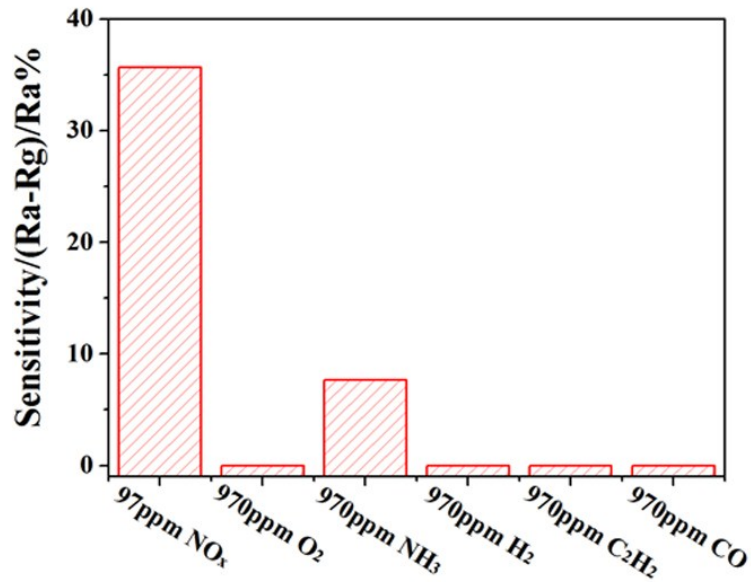


Fig. S3 Response of the Fe₃O₄/rGO2-400 sensor to different gases at room temperature

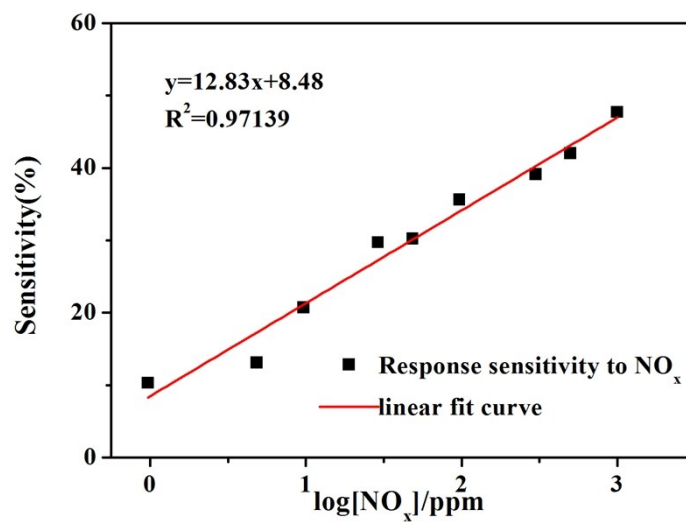


Fig. S4 Linear dependence relation between the gas sensitivity and relative NO_x concentration for Fe₃O₄/rGO2-400 sensor to different gases at room temperature