

Electronic Supporting Information

Controllable synthesis and enhanced gas sensing properties of single-crystalline WO₃-rGO porous nanocomposite

Qin Hao,^a Tie Liu,^a Jingyuan Liu,^{a,*} Qi Liu,^a Xiaoyan Jing,^a Hongquan Zhang,^b Guoqing Huang,^c
and Jun Wang^{a,*}

^a Key Laboratory of Superlight Material and Surface Technology, Ministry of Education, Harbin Engineering University, Harbin 150001, PR China.

^b School of Automation, Harbin Engineering University, Harbin 150001, PR China.

^c Handan Purification Equipment Research Institute, Handan 056027, P.R. Chinas.

* Corresponding author: Tel.: +86 451 8253 3026; Fax: +86 451 8253 3026; E-mail: zhqw1888@sohu.com.

Experimental procedure

Synthesis of WO₃ porous nanolamellas. In a typical synthesis procedure performed as follow,^{S1} sodium tungstate (99.5% purity, 6.12 mmol) was dissolved in 12.5 mL of DW (distilled water) by ultrasonic treatment. Next, 12.5 mL HCl solution (37%, 2 M) was added dropwise under gentle magnetic stirring. Brief, the mixture of H₂C₂O₄ (99.5% purity, 1.53 mmol) and DW (25 mL) were added into the precursor solution. After stirring ca.20 min, the final solution was transferred to a Teflon-lined stainless autoclave, which was heated 180°C for 5h in air flow electric oven. After cooling down, the obtained yellow precipitate washed by distilled water and ethanol several times prior to being dried at 60 °C for 10 h. Eventually, the final lamellar sample was collected after the calcination process at 500 °C for the gas sensing test further.

Associated contents:

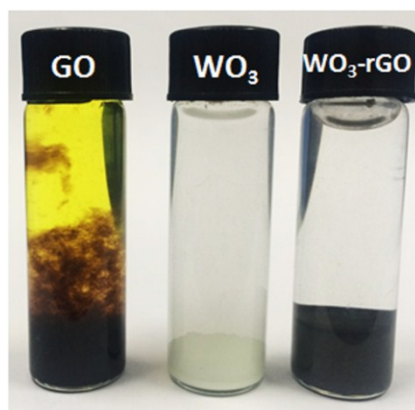


Fig. S1 The photographs of three samples solution: (a) the GO solution, (b) WO₃ solution and (c) WO₃-rGO solution.

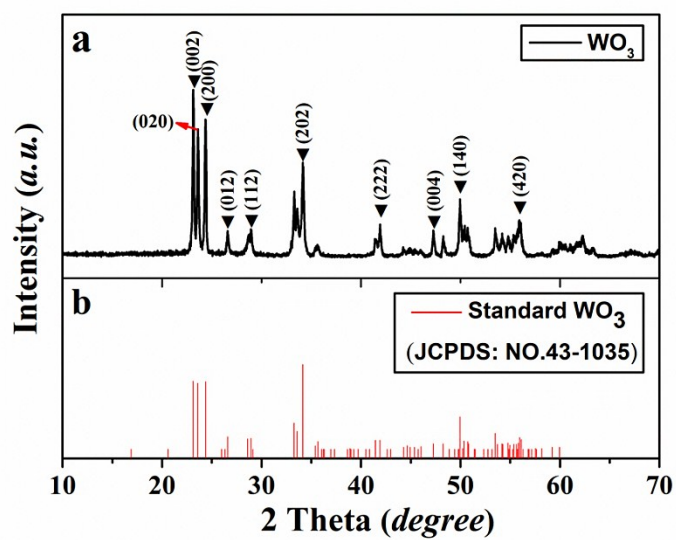


Fig. S2 XRD patterns of precursor of (a) WO₃ nanolamellas after annealing, S2; (b) the standard card of WO₃ (JCPDS no. 43-1035).

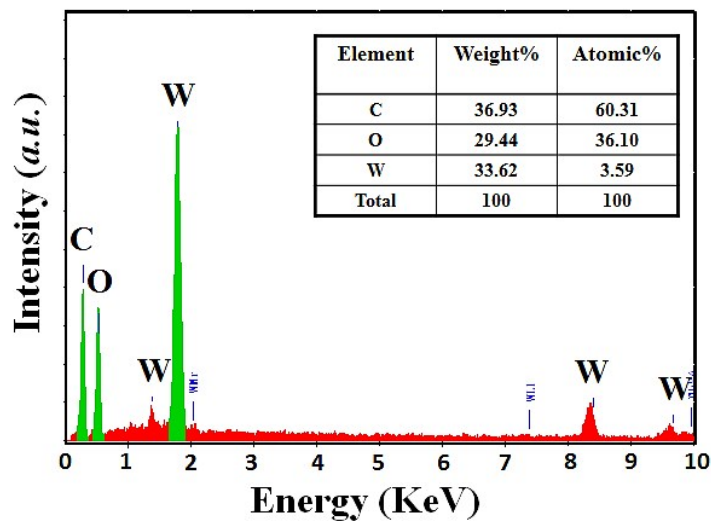


Fig. S3 The EDS analysis spectrum of final WO_3 -rGO sample after calcination (S1).

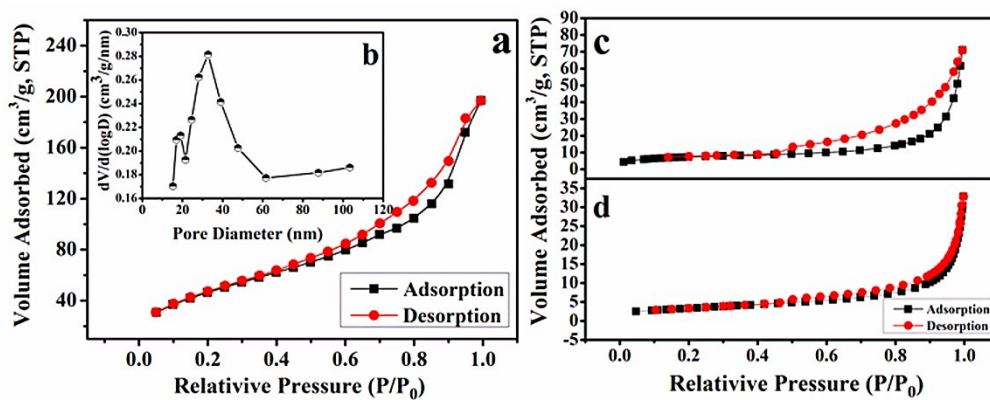


Fig. S4 (a) N_2 adsorption-desorption isotherm, (b, inset) BJH pore-size distribution plots of S1; (c, d) N_2 adsorption-desorption isotherms of S2 and S3, respectively.

Reference

S1 T. Liu, J. Liu, Q. Hao, X. Jing, H. Zhang, G. Huang and J. Wang, *CrystEngComm*, 2016, **18**, 8411-8418.