Supporting information

An AuNPs-functionalized AlGaN/GaN high electron mobility transistor sensor for ultrasensitive detection of TNT

Yahui Guo,a,c‡ Xiongtao Wang,a,d‡ Bin Miao,a,b Ying Li,d Weirong Yao,e Yunfei Xie,e Jiadong Li,a,b,* Dongmin Wu,a,b,* and Renjun Pei,c

a. i-Lab, Suzhou Institute of Nano-Tech and Nano-Bionics, Chinese Academy of Sciences, Suzhou 215125, China
b. Key Laboratory of Nanodevices and Applications, Suzhou Institute of Nano-Tech and Nano-Bionics, Chinese Academy of Sciences, Suzhou 215123, China
c. Division of Nanobiomedicine, Key Laboratory for Nano-Bio Interface, Suzhou Institute of Nano-Tech and Nano-Bionics, Chinese Academy of Sciences, Suzhou 215123, China
d. Key Laboratory for New Type of Functional Materials in Hebei Province, School of Material and Engineering, Hebei University of Technology, Tianjin 300130, China
e. State Key Laboratory of Food Science and Technology, School of Food Science and Technology, Jiangnan University, Wuxi 214122, China.
‡ X. Wang and Y. Guo contributed equally to this work.

* J.Li: jdli2009@sinano.ac.cn; D. Wu: dmwu2008@sinano.ac.cn
Fig. S1. UV-vis absorption spectrum of the synthesized AuNPs with maximum absorbance at 520 nm for a diameter of 15 nm.

Fig. S2. The relationship between gate voltage (V) and source-drain current (mA).
Fig. S3. SEM image of the AlGaN/GaN HEMT sensor surface after modifying AuNPs without the functionalization of MPTES.

Fig. S4. (A) Real-time response of the AlGaN/GaN HEMT sensor to increasing concentrations of TNT (10 ppt, 100 ppt, 1 ppb, 10 ppb). (B) Magnified $I_{ds}$-versus-time of the sensor following addition of 10 ppt TNT solution. The signal intensity was collected as the average value of $I_{ds}$ from 30–60s after injecting TNT.

References: