

Supplementary Data

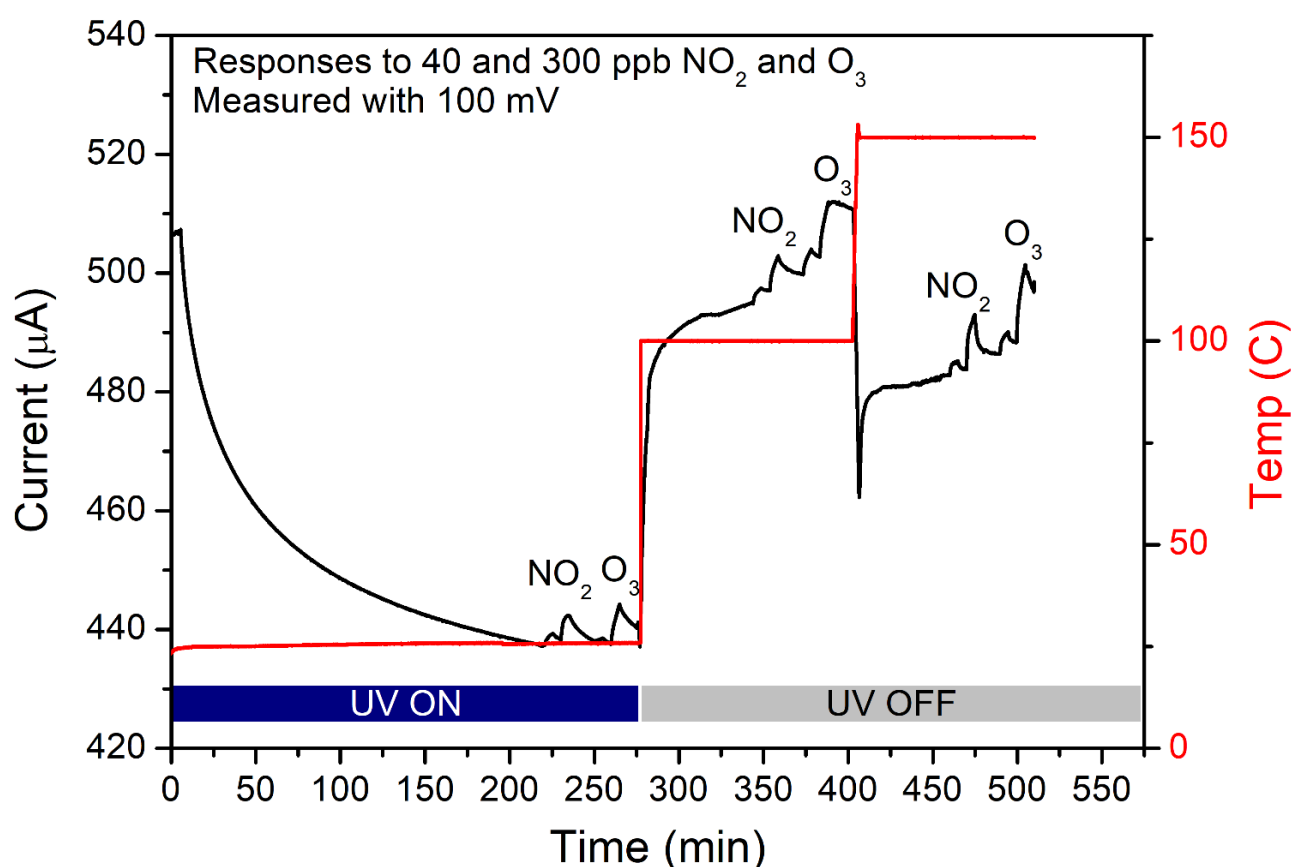
# Gas-Sensing Properties of Graphene Functionalized with Ternary Cu-Mn Oxides for E-Nose Applications

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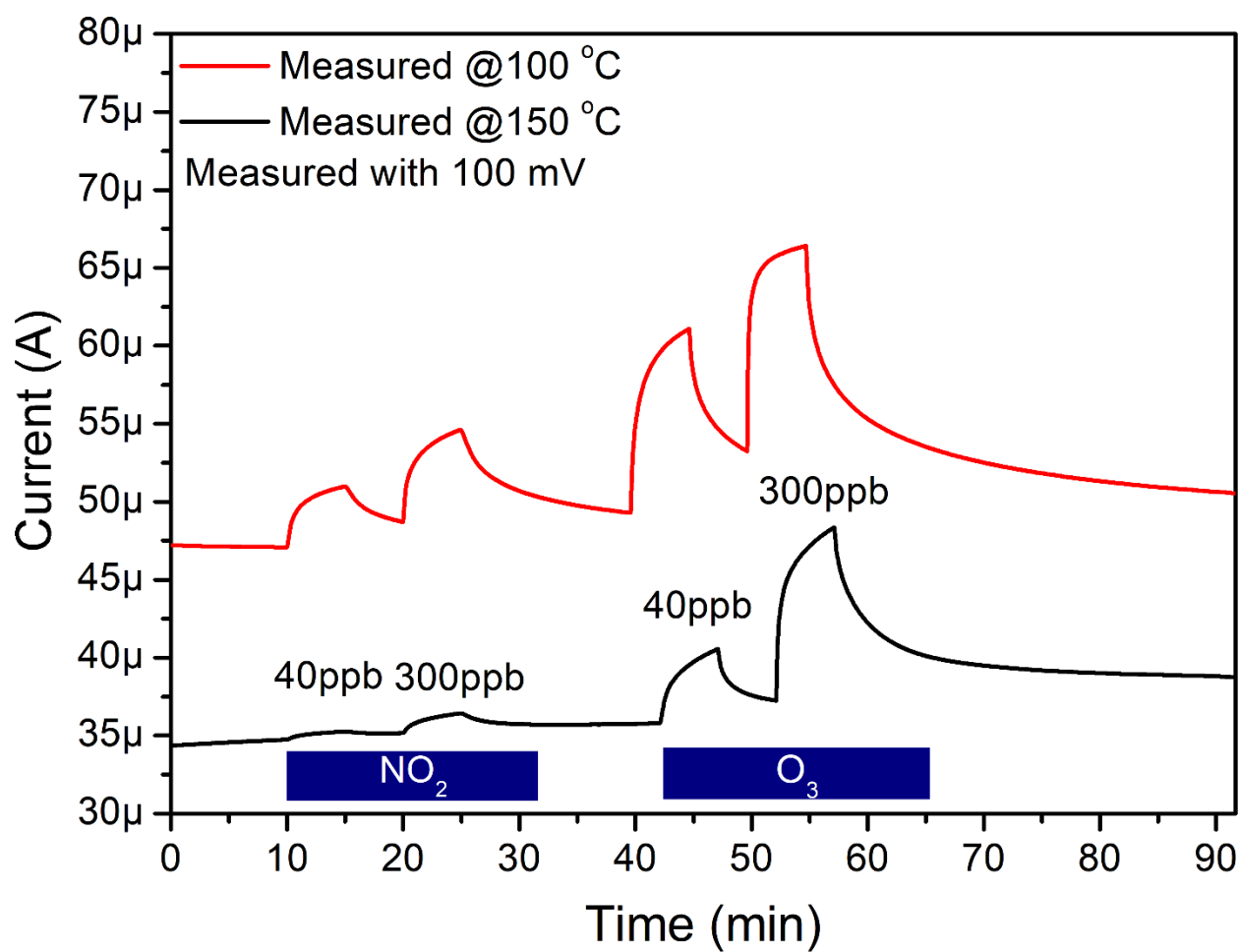
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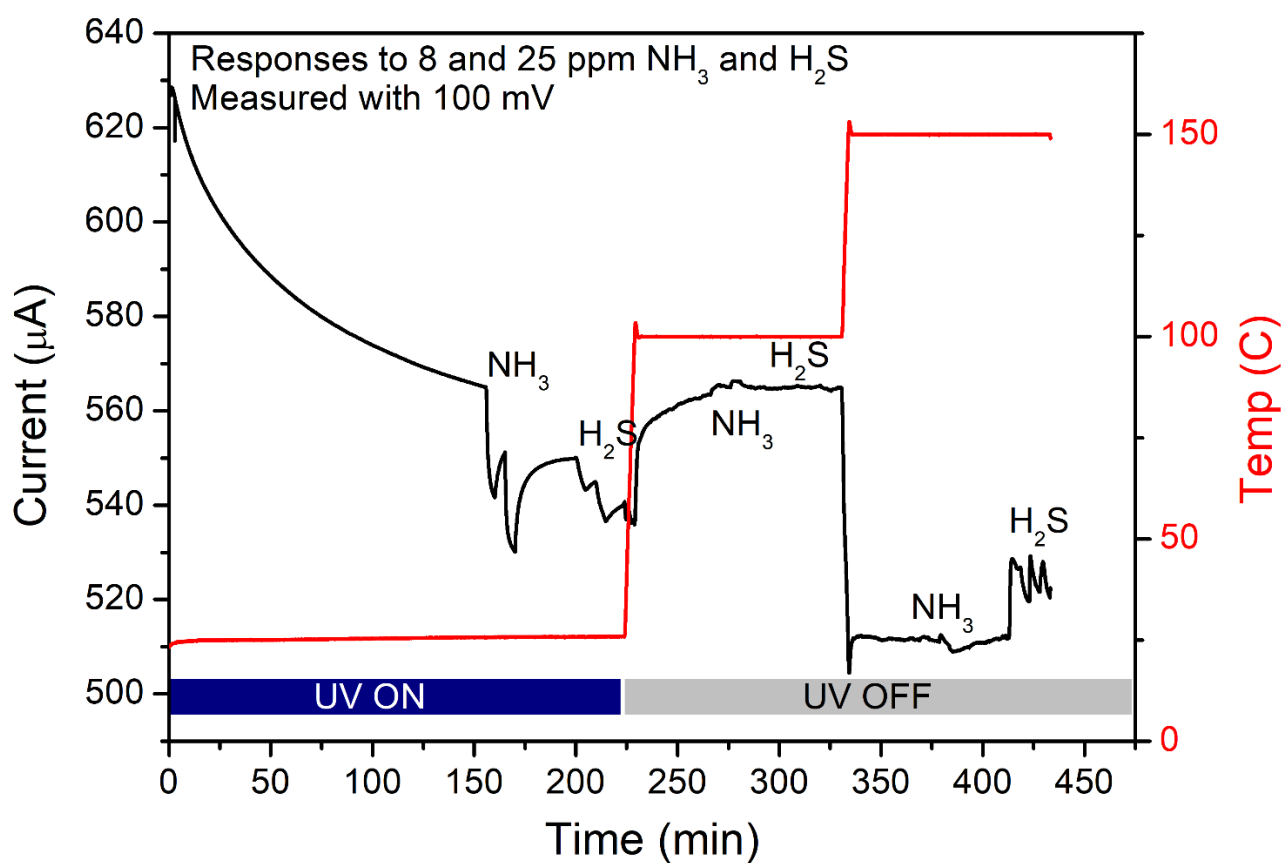
Raw data are presented for sensor elements subjected to two consecutive gas pulses at concentrations indicated, for pairs of oxidizing ( $\text{NO}_2$ ,  $\text{O}_3$ ) and reducing ( $\text{NH}_3$ ,  $\text{H}_2\text{S}$ ) gases, respectively. The peak maxima/minima of the “sawteeth” in time traces mark the termination of a gas pulse. Solely the room temperature (RT) measurements were performed under light exposure (365 nm at  $\sim 15 \text{ mW/cm}^2$ ), because of usually slow recovery in the dark. Otherwise, the figures are self-explanatory. Figures S1 and S3 illustrate the behavior of purposefully not functionalized, “pristine” CVD graphene.



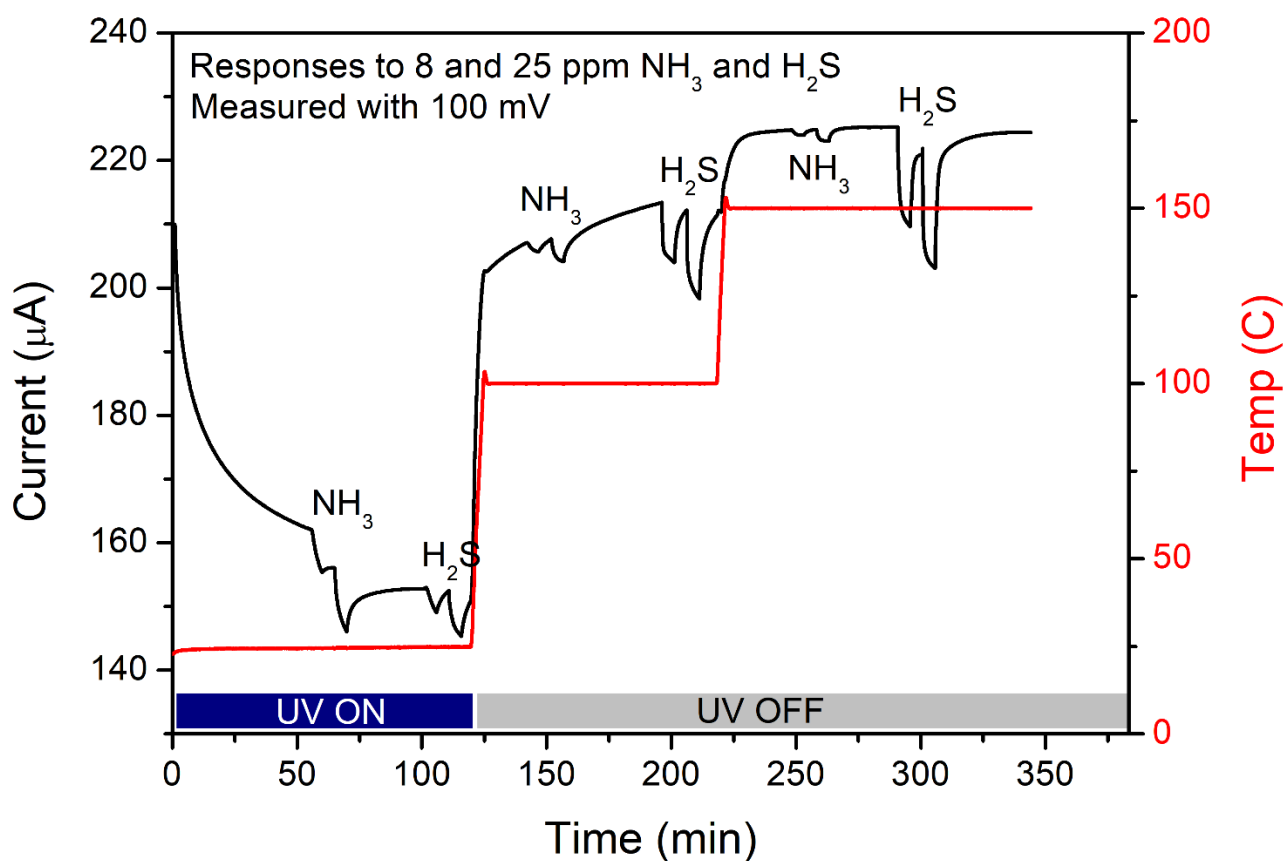
**Figure S1.** Conductive responses to  $\text{NO}_2$  and  $\text{O}_3$  of pristine (not functionalised) graphene sensor. Consecutive measurements at room temperature + UV light excitation, 100 and 150  $^{\circ}\text{C}$ . Measured with synthetic air (79/21%  $\text{N}_2/\text{O}_2$ ) and 50% relative humidity background. Red trace/right scale indicate temperature.



**Figure S2.** Conductive responses to NO<sub>2</sub> and O<sub>3</sub> of graphene sensor functionalized with PLD CuMn<sub>2</sub>O<sub>4</sub> deposited at 300 °C and measured at 100 and 150 °C. Measured with synthetic air (79/21% N<sub>2</sub>/O<sub>2</sub>) and 50% relative humidity background.



**Figure S3.** Conductive responses to  $\text{NH}_3$  and  $\text{H}_2\text{S}$  of pristine (not functionalised) graphene sensor. Consecutive measurements at room temperature + UV light excitation, 100 and 150 °C. Measured with synthetic air (79/21%  $\text{N}_2/\text{O}_2$ ) and 50% relative humidity background. Red trace/right scale indicate temperature.



**Figure S4.** Conductive responses to  $\text{NH}_3$  and  $\text{H}_2\text{S}$  of graphene sensor functionalized with PLD  $\text{CuMn}_2\text{O}_4$  deposited at RT. Consecutive measurements at room temperature + UV light excitation, 100 and 150  $^{\circ}\text{C}$ . Measured with synthetic air (79/21%  $\text{N}_2/\text{O}_2$ ) and 50% relative humidity background. Red trace/right scale indicate temperature.