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## Supplementary Material

# Plasma Polymerized Thiophene-Reduced Graphene Oxide Composite Film Sensor for Ammonia/Amine Detection at Room Temperature

# Plasma-Polymerized Thiophene-Reduced Graphene Oxide Composite Film Sensor for Ammonia/Amine Detection at Room Temperature

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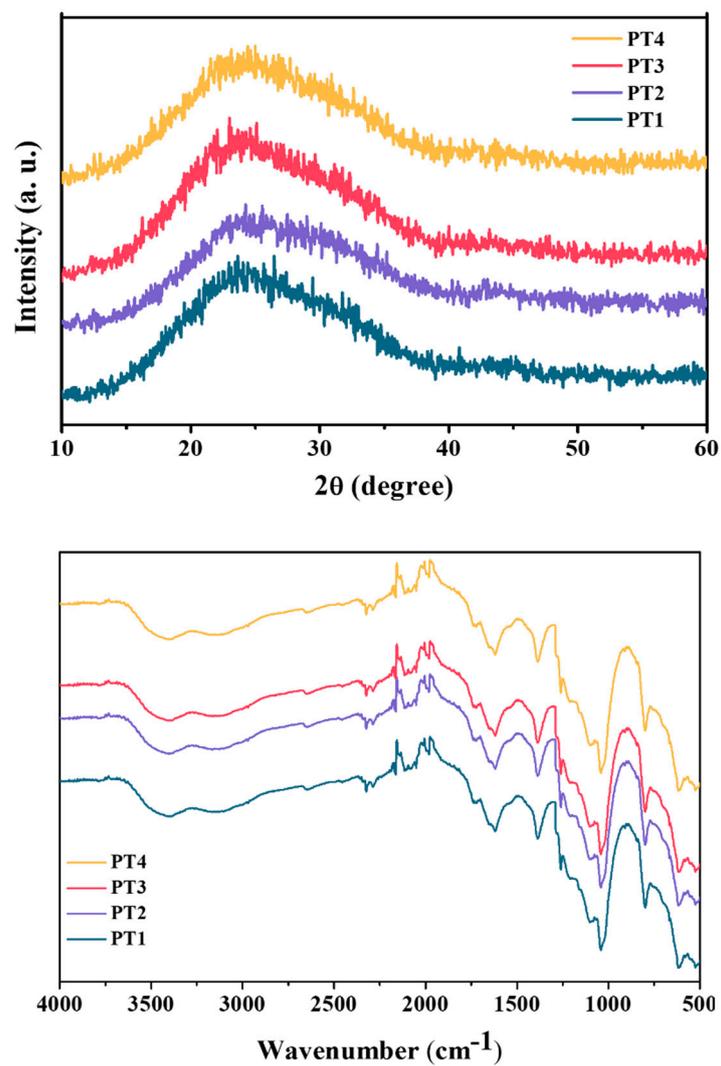
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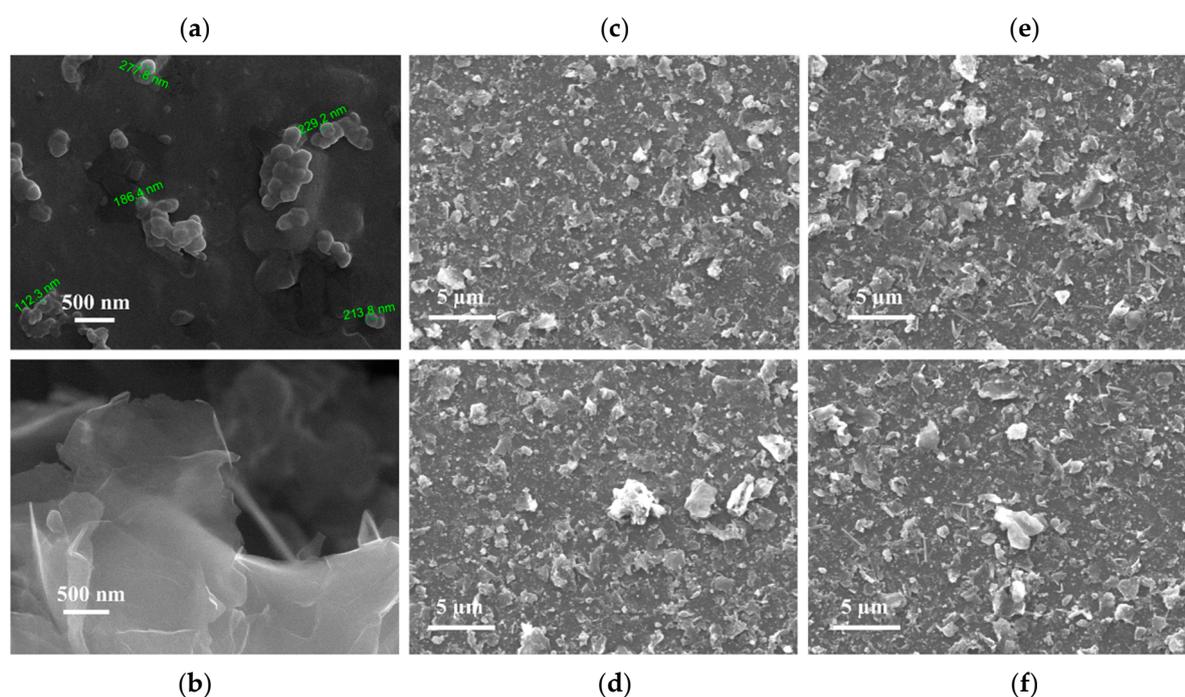
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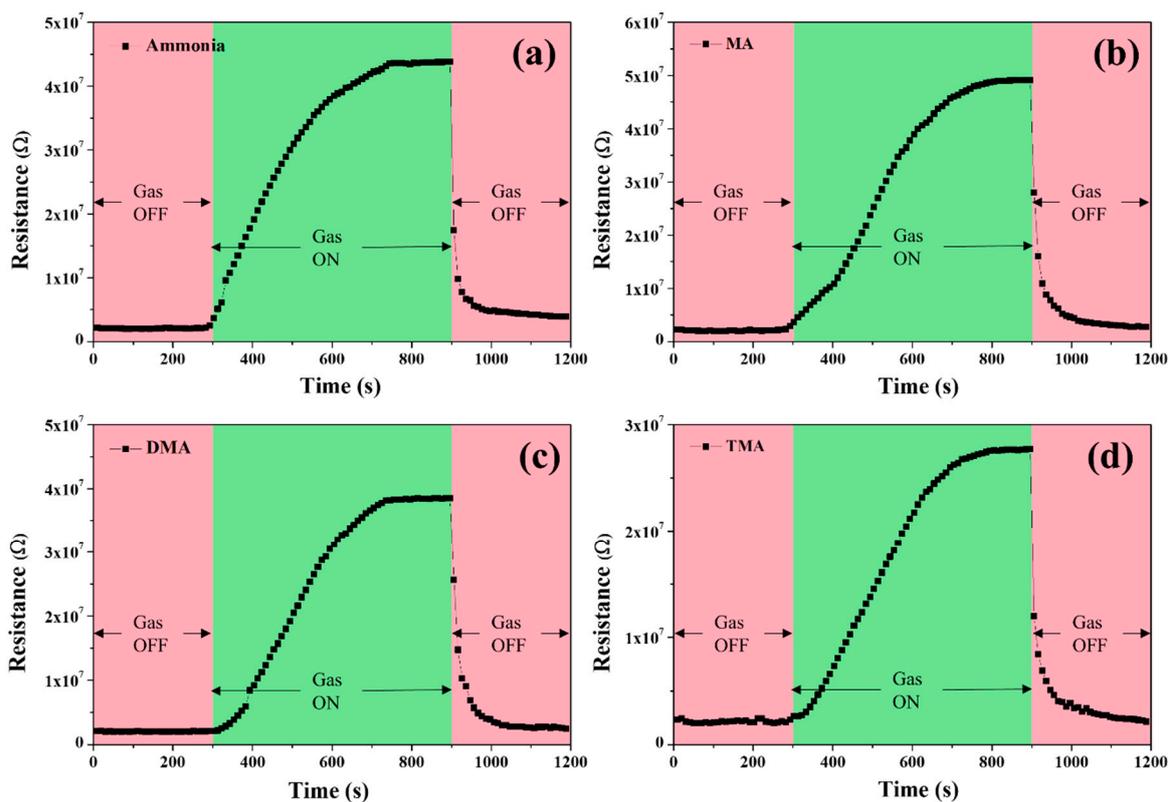
**Figure S1.** (a) XRD spectra of as deposited PPTth films PT1, PT2, PT3 and PT4. (b) FTIR spectra of as deposited PPTth films PT1, PT2, PT3 and PT4.



**Figure S2.** FE-SEM images of (a) PPTth film P2 and (f) rGO powder; SEM images of (a) PT1G3, (b) PT2G3, (c) PT3G3 and (d) PT4G3.

### SEM images

Figure S2 (a) show FE-SEM images of as deposited PPTth film. Average granule size in PPTth material is around 200 nm. These are the same grains that allow enhanced adsorption of the analyte gas [1]. In Figure S2 (b), high magnification image of rGO is shown. One can clearly see sheets like structure of the rGO powder. This structure is effective in trapping analyte gas molecules [2]. Figure S2 (c)-(f) depict SEM images of final PPTth-rGO composite samples PT1G3, PT2G3, PT3G3 and PT4G3. Here base sample of PPTth is changed keeping rGO concentration optimum. There is no noticeable change in the surface morphology of the samples as rGO concentration is constant throughout.



**Figure S3.** Sensing cycles showing change in resistance of PPTth-rGO composite PT2G3 for (a) ammonia, (b) MA, (c) DMA and (d) TMA at 1000 ppm each.

#### References:

1. Wang, X.; Yong, Y.; Yang, W.; Zhang, A.; Xie, X.; Zhu, P.; Kuang, Y. Adsorption, Gas-Sensing, and Optical Properties of Molecules on a Diazine Monolayer: A First-Principles Study. *ACS Omega* **2021**, *6*, 11418–11426, doi:10.1021/acsomega.1c00432.
2. Singh, S.A.; More, P.S.; Kholam, Y.B.; Kondawar, S.B. Enhanced Hydrogen Gas Sensing Characteristics of Graphene Modified with Rubidium (Rb). *Mater Chem Phys* **2021**, *260*, 124105, doi:10.1016/j.matchemphys.2020.124105.