Electronic Supplementary Material (ESI) for Journal of Materials Chemistry C.
This journal is © The Royal Society of Chemistry 2017

Supporting Information

Porous graphene oxide chemi-capacitor vapor sensor array

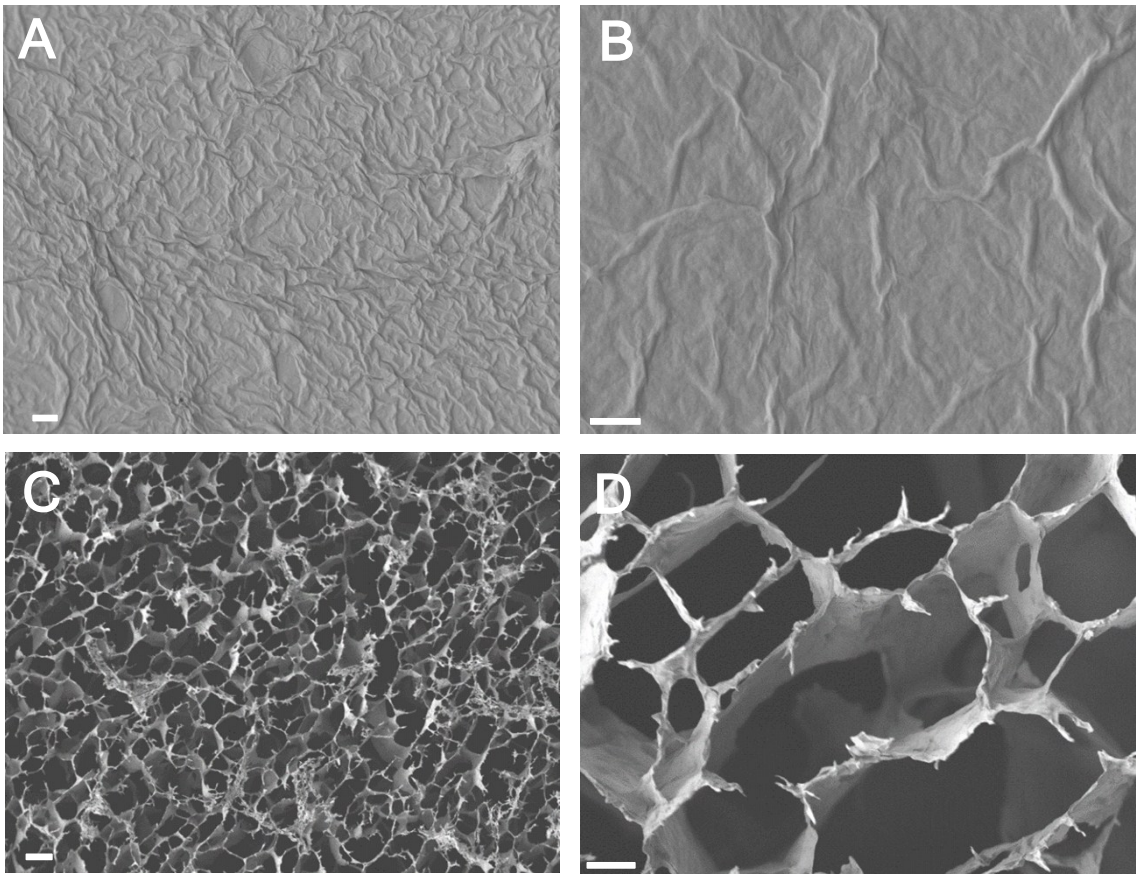

Figure S1. **SEM micrographs**. **A** and **B**. graphene oxide (GO); **C** and **B**. pGO; Scale bars. A and C. 10 μm and B and D. 1 μm.

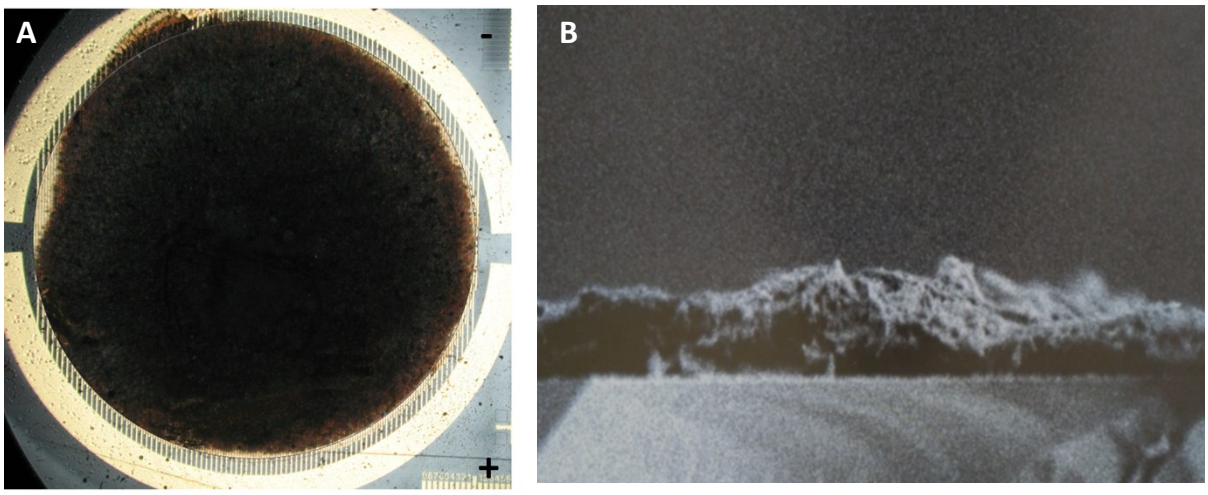

Figure S2. **Micrographs**. **A**. Porous graphene oxide (pGO) modified IDE and **B**. Side view of pGO/IDE.

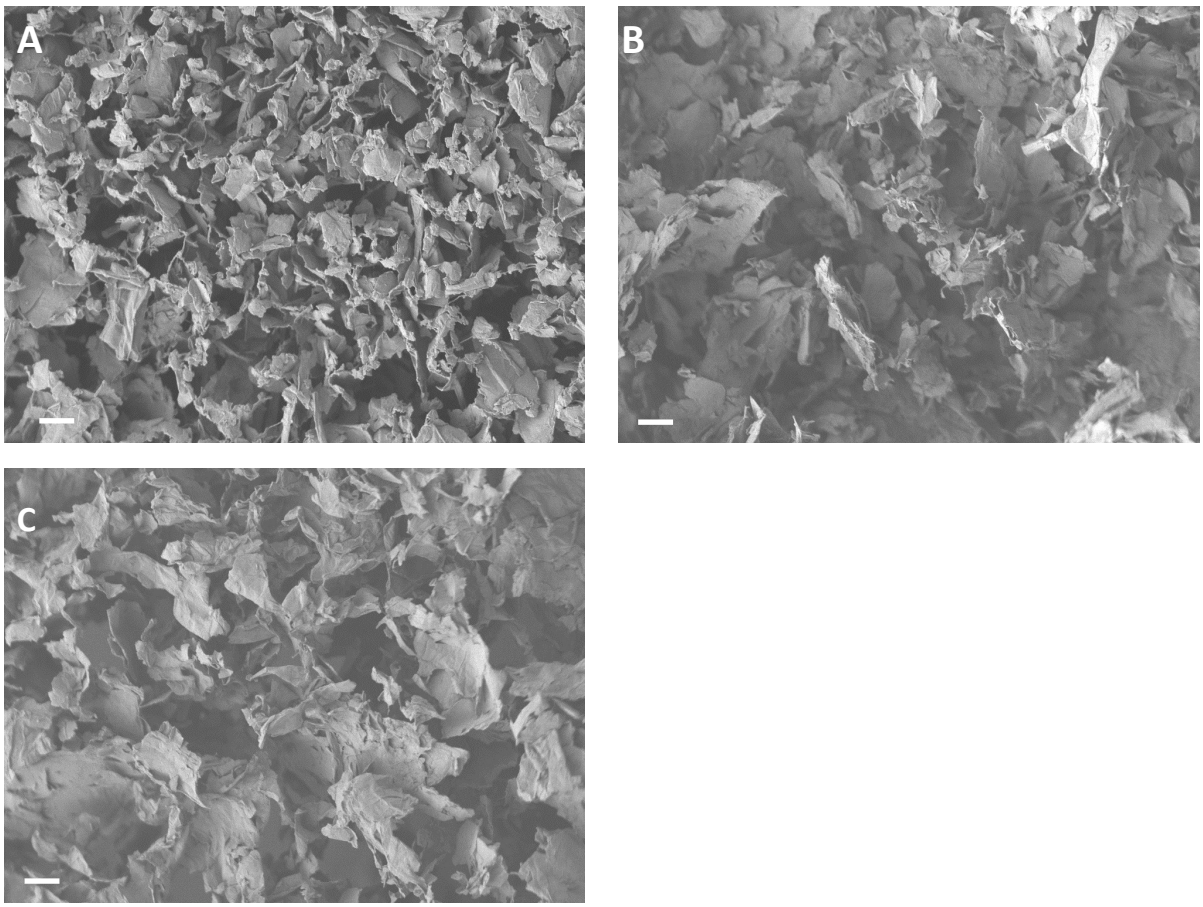

Figure S3. **SEM micrographs**. **A.** phenyl-pGO **C.** dodecyl-pGO and **D**. ethanol-pGO. Scale bars. A, B and C. 1 μm.

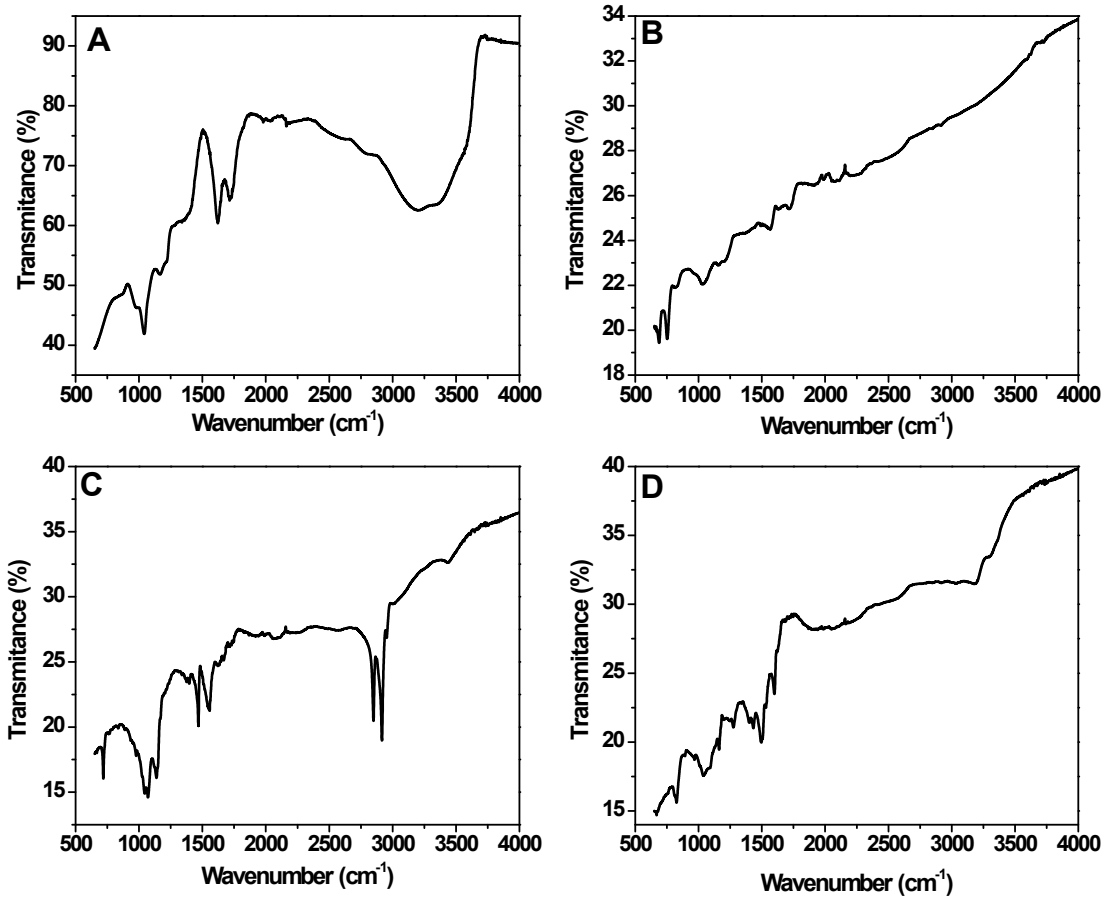

Figure S4. **FTIR spectra**. **A.** GO, **B.** phenyl-GO **C.** dodecyl-GO and **D**. ethanol-GO.

Various functionalities of GO derivatives were examined by FTIR spectroscopy (Figure S3 A-D, Supporting Information). GO exhibited vibrational bands at 3360 cm-1, 1723 cm^{-1}, 1222 cm^{-1}, and 1046 cm^{-1}, are attributed to the stretching mode of the hydroxyl (O–H), carbonyl (C=O), C–OH and C–O (epoxy) groups (Figure S3 A, Supporting Information), respectively [28]. The carboxylic group of GO reacts with thionyl chloride and forms acyl chloride, which is active towards amines. The coupling of various amines (aniline, dodecylamine and ethanolamine) with acylated GO leads to the formation of amide bond. The presence of amide bond in the functionalized-GOs was revealed by the appearance of a new peak in the range of 1626–1635 cm^{-1} (Figure S3 B-D, Supporting Information). The vibrational peak in the range of 1546-1595 cm^{-1} is assigned to an overlapped signature of the N–H bond and sp^2 carbon domains. The band appearing in the range of 1143-1200 cm^{-1} is attributed to the stretching mode of C–N linkage of amide [28].

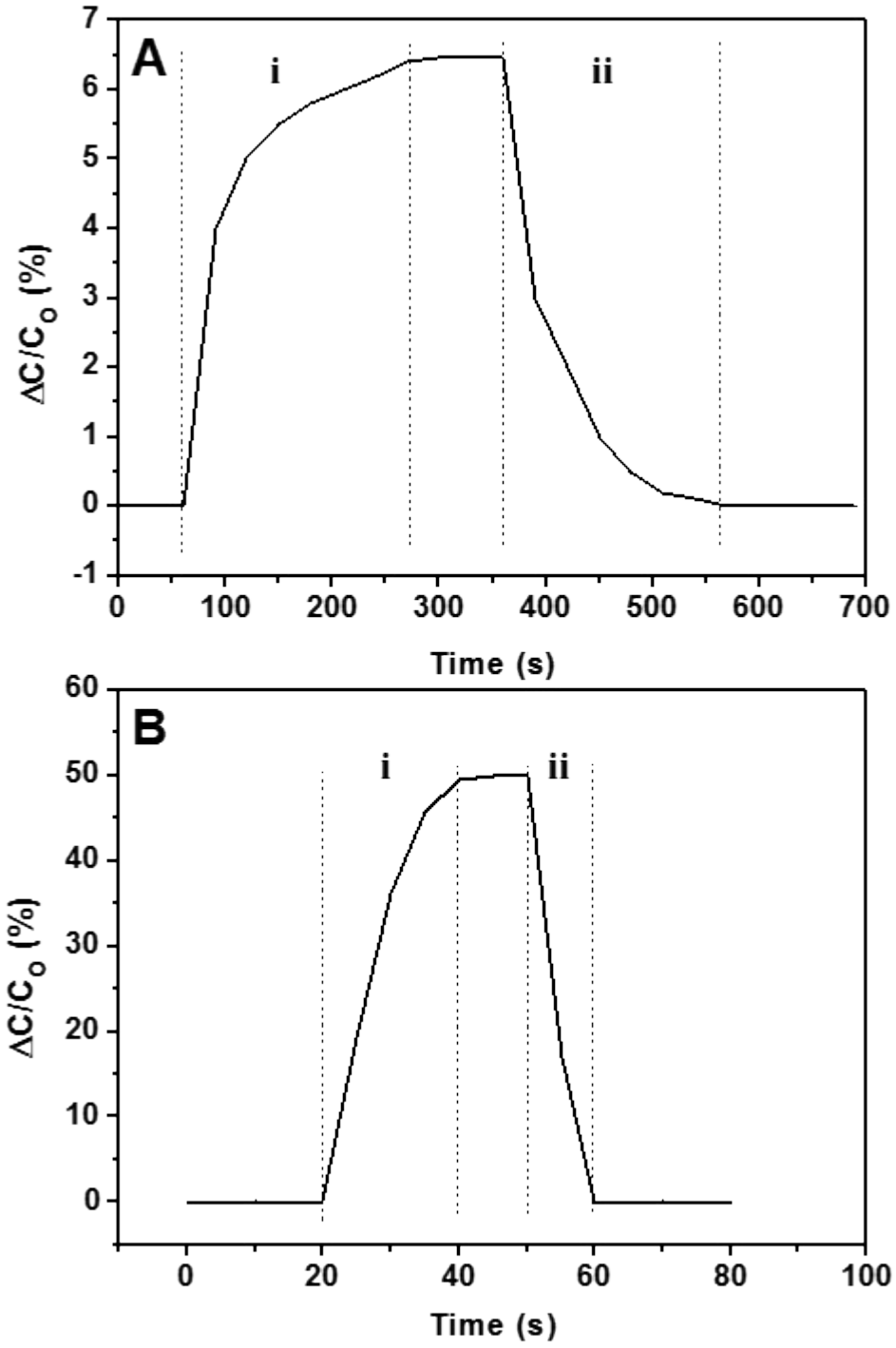

Figure S5. Response and recovery time of ammonia. **A**. **GO**/IDE (i. response time-210 s; ii. recovery time-200 s) and **B**. **pGO**/IDE (i. response time-20 s; ii. recovery time-10 s).