Electronic Supplementary Information for

**Rapid-response, reversible and flexible humidity sensing platform using a hydrophobic and porous substrate**

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Figure S1. SEM images of the LCP substrate with increased magnification from (a) to (c).

Figure S2. Energy-dispersive X-ray (EDX) spectra of the graphene oxide (GO).
Figure S3. EDX spectra of the reduced graphene oxide (RGO). The Au signal results from a thin layer conductive Au coating on RGO surface used for SEM characterization.

Figure S4. EDX spectra of carbon nanocoils (CNCs). The signal of silicon is originated from the silicon substrate.
**Figure S5.** Dynamic response of the GO/LCP sensor to the low relative humidity (RH) of 4%.

**Figure S6.** Plot of the standard deviation of the GO/LCP sensor versus RH for the detection of each RH with repeated five cycles.
Figure S7. Comparison of the quantitative responses of the GO/CLP to the deep mouth breath and shallow nose breath.

Figure S8. Analyses of the response and recovery time of the CNC/LCP sensor from the dynamic response curve to 8% RH.