Highly sensitive flexible humidity sensor based on conductive tape and carboxymethyl cellulose@graphene composite

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Fig. S1 Digital photo of the sensor made in the 3-D printed mold.
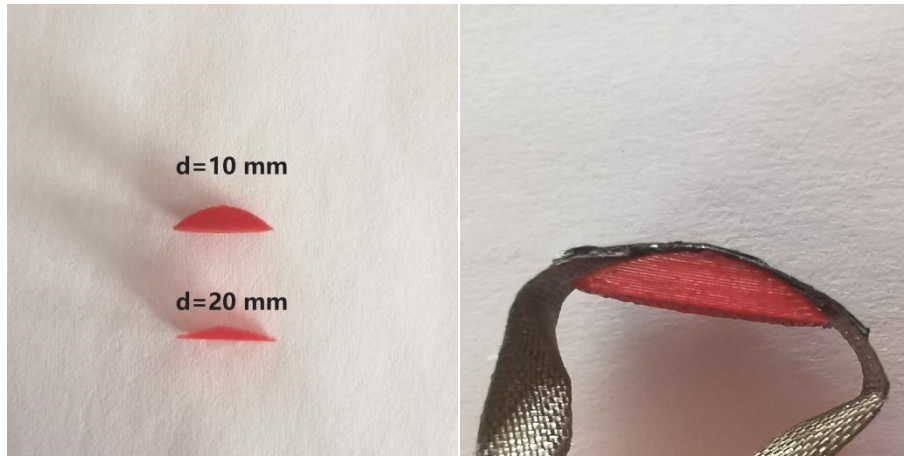
Fig. S2 (a) Digital photo of the 3D-printed semi-cylindrical plastic molds with diameter of 10 mm and 20 mm,(b) the sensor necked-out on the mold for flexibility test.
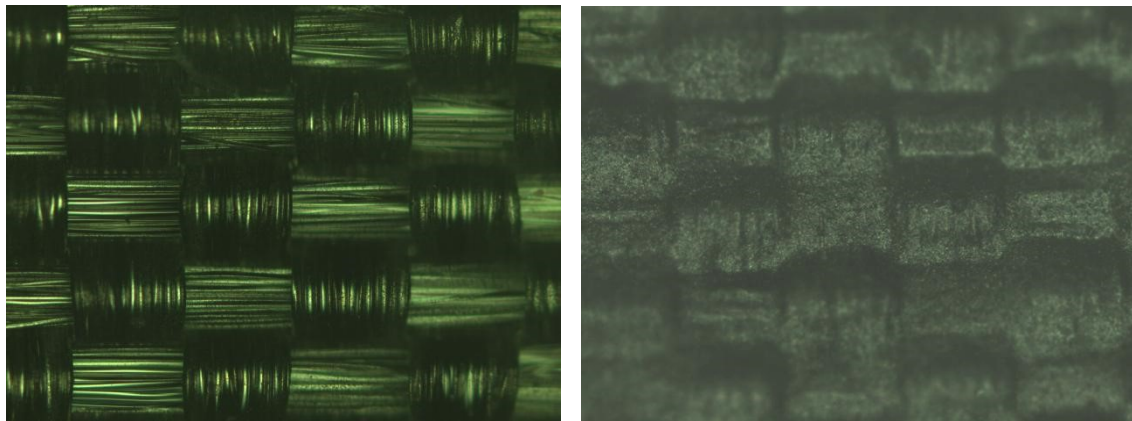

Fig. S3 The surface morphology of the conductive tape (a) and the CMC@graphene leveled conductive tape (b).

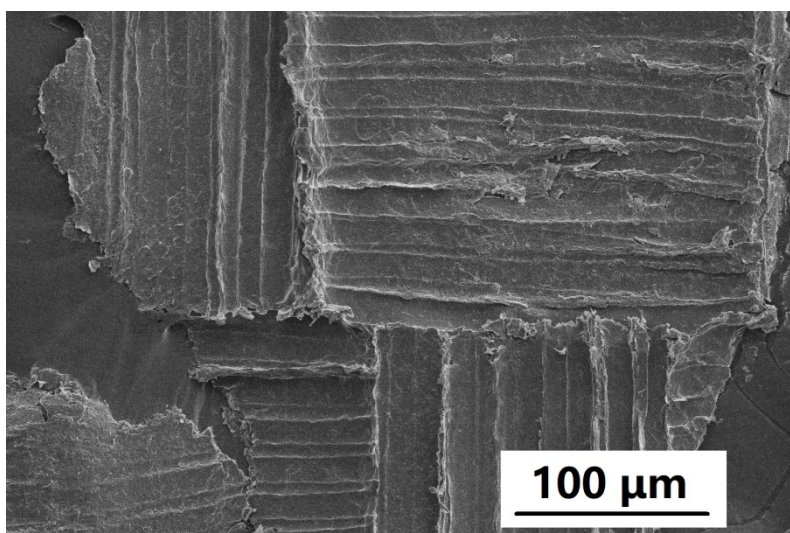**Fig. S4** Elemental mapping of the conductive tape surface.

Fig. S5 SEM image with 500 × magnification.

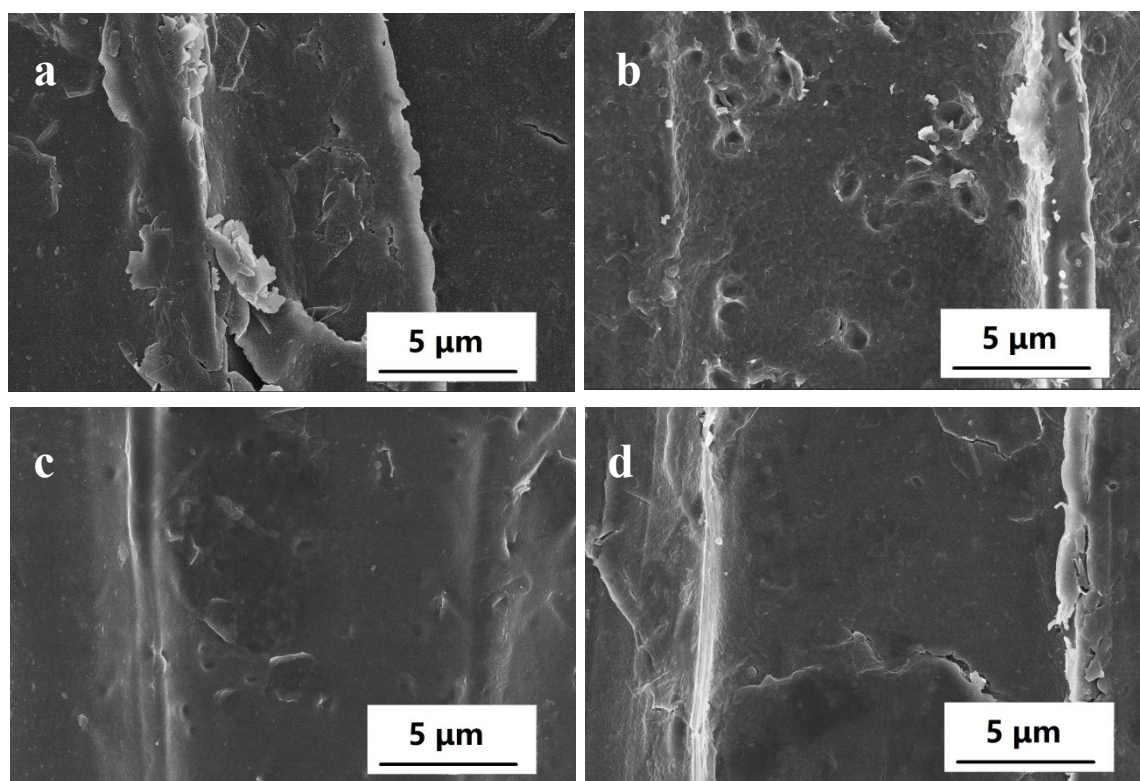**Fig. S6** Elemental mapping of the CMC@graphene composite.

Fig. S7 SEM images of the CMC composite with graphene addition amount of 0.10 wt % (a), 0.13 wt % (b), 0.19 wt % (c), and 0.22 wt% (d).
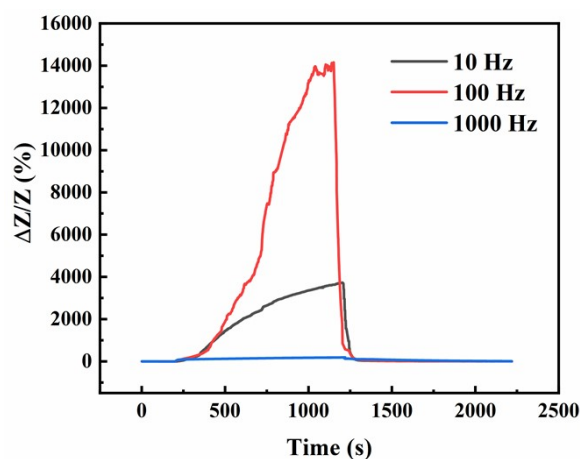
Fig. S8 Response ($\Delta Z/Z$) curves at different frequency of 10 Hz, 100 Hz and 1000 Hz. (RH from 11% to 95%, voltage: 0.2 V).
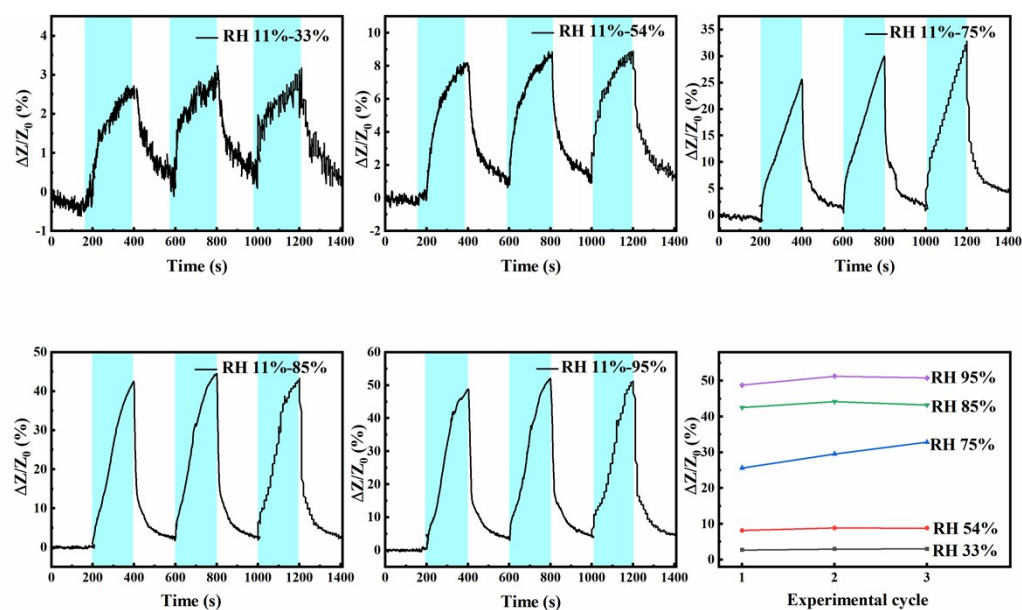

Fig. S9 Response ($\Delta Z/Z_0$) curves in consecutive sensing cycles (voltage: 0.2 V, frequency: 100 Hz).
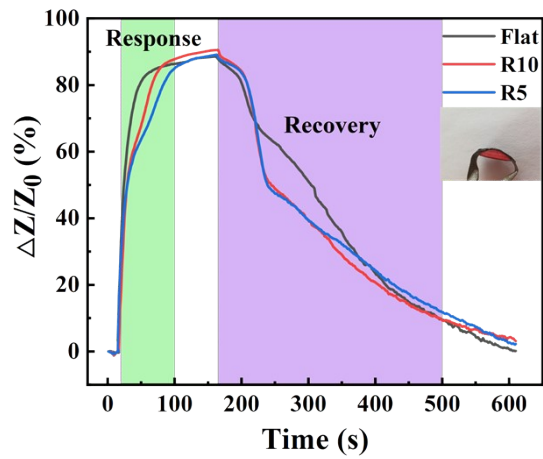
Fig. S10 Response ($\Delta Z/Z_0$) curves in flat, bending radius of 5 mm and 10 mm (voltage: 0.2 V, frequency: 100 Hz).
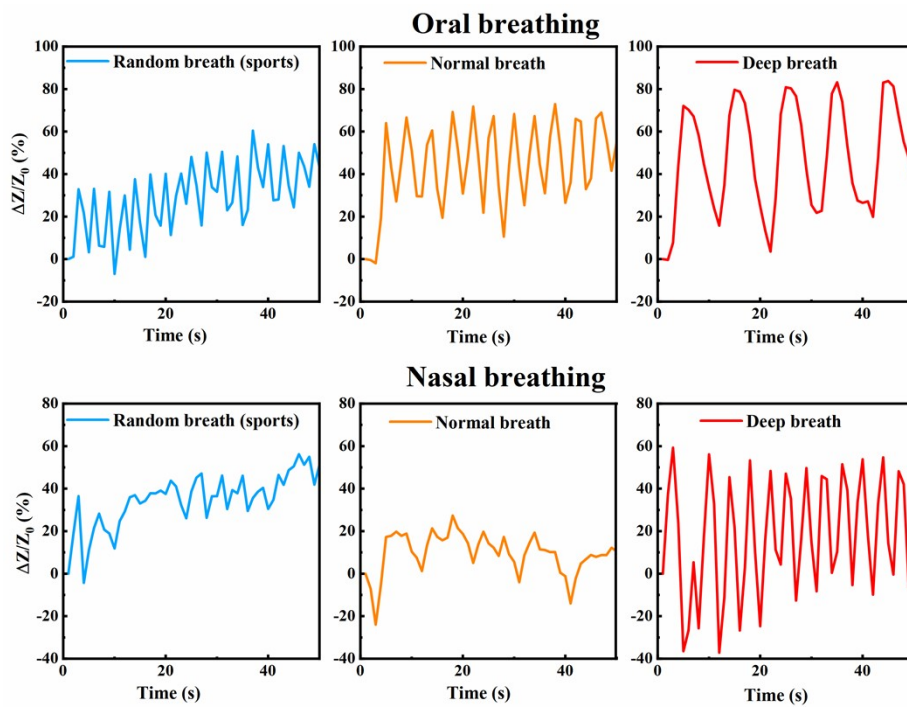

Fig. S11 Response ($\Delta Z/Z_0$) curves in the nasal breathing and oral breathing test (voltage: 0.2 V, frequency: 100 Hz).