

Supporting Information

Moisture electric generators with $\text{Ti}_3\text{C}_2\text{T}_x$ -gelatin nanocomposites driven by the hydrovoltaic effect for self-powered flexible humidity sensors

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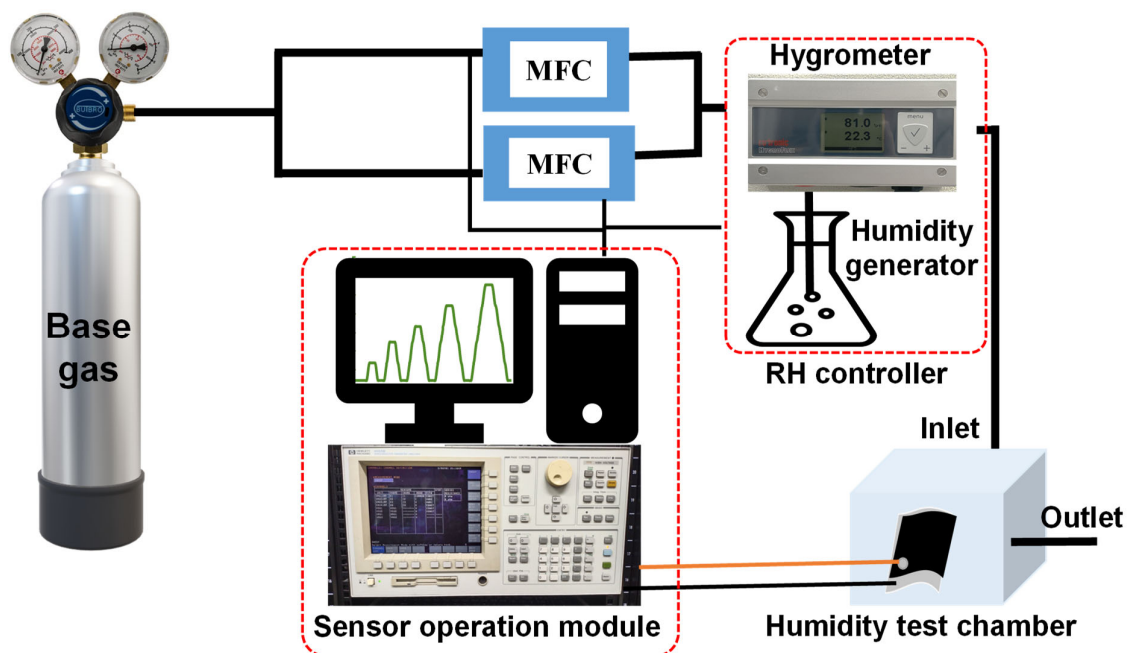


Figure S1. Schematic of the sensor testing system.

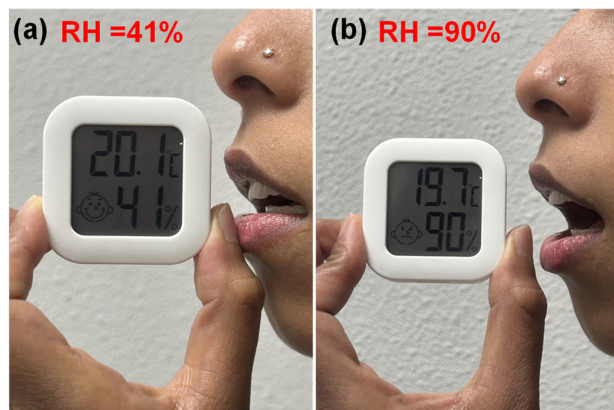


Figure S2. Digital representation of the humidity range of human breath. Humidity observed during (a) normal and (b) excess exhalation.

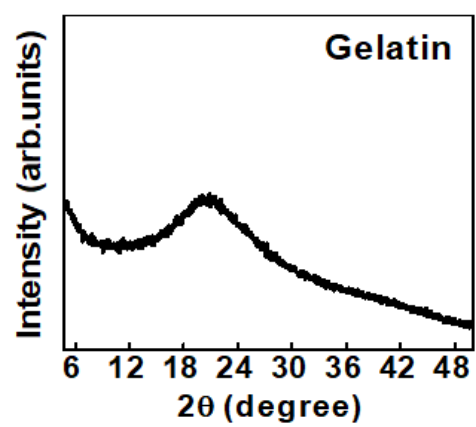


Figure S3. XRD pattern of gelatin.

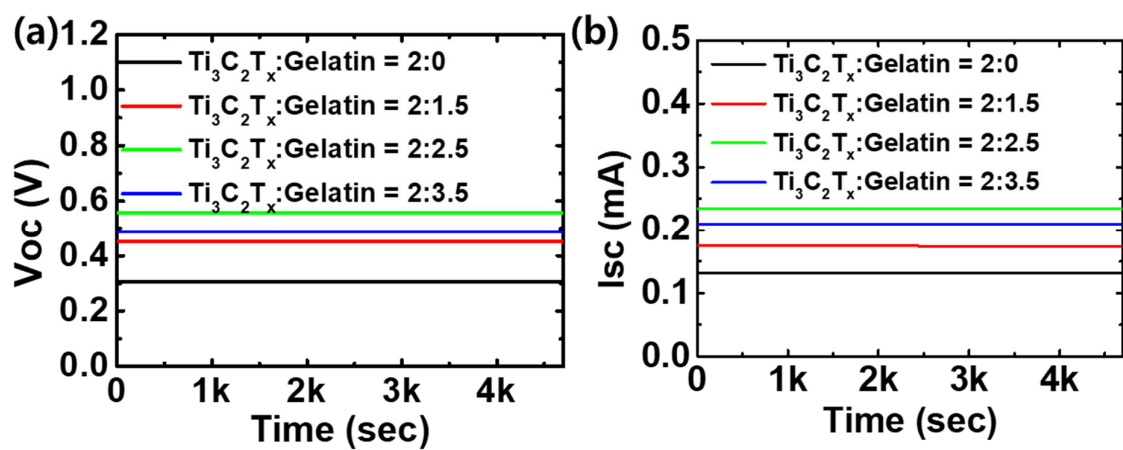


Figure S4. (a) V_{oc} and (b) I_{sc} of $\text{Ti}_3\text{C}_2\text{T}_x$ -gelatin synthesized with different gelatin contents.

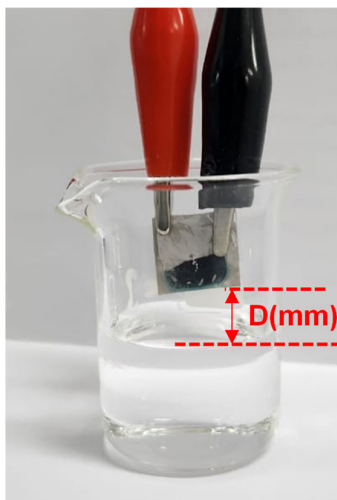


Figure S5. Schematic of the setup for generating V_{oc} and I_{sc} by $Ti_3C_2T_x$ -gelatin as a function of water level.

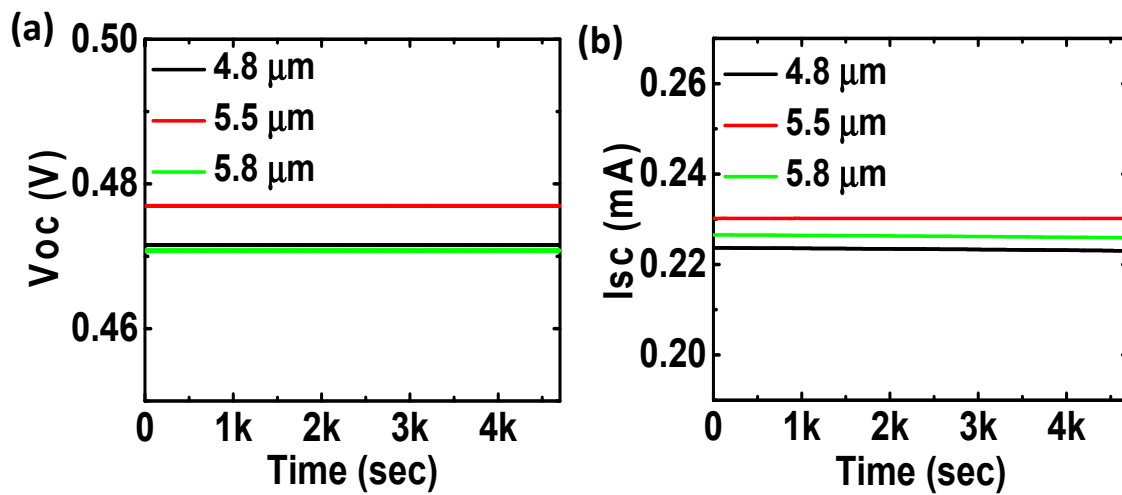


Figure S6. (a) V_{oc} and (b) I_{sc} of $\text{Ti}_3\text{C}_2\text{T}_x$ -gelatin nanocomposite films as a function of film thickness (4.8, 5.5, and 5.8 μm).

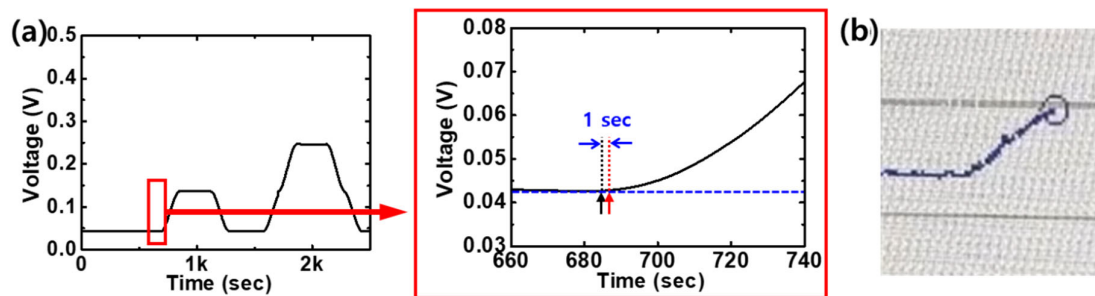


Figure S7. (a) Dynamic response curves of $\text{Ti}_3\text{C}_2\text{T}_x$ -gelatin nanocomposite films and a magnified graph for a response speed. (b) Snapshot of a real-time response curve.

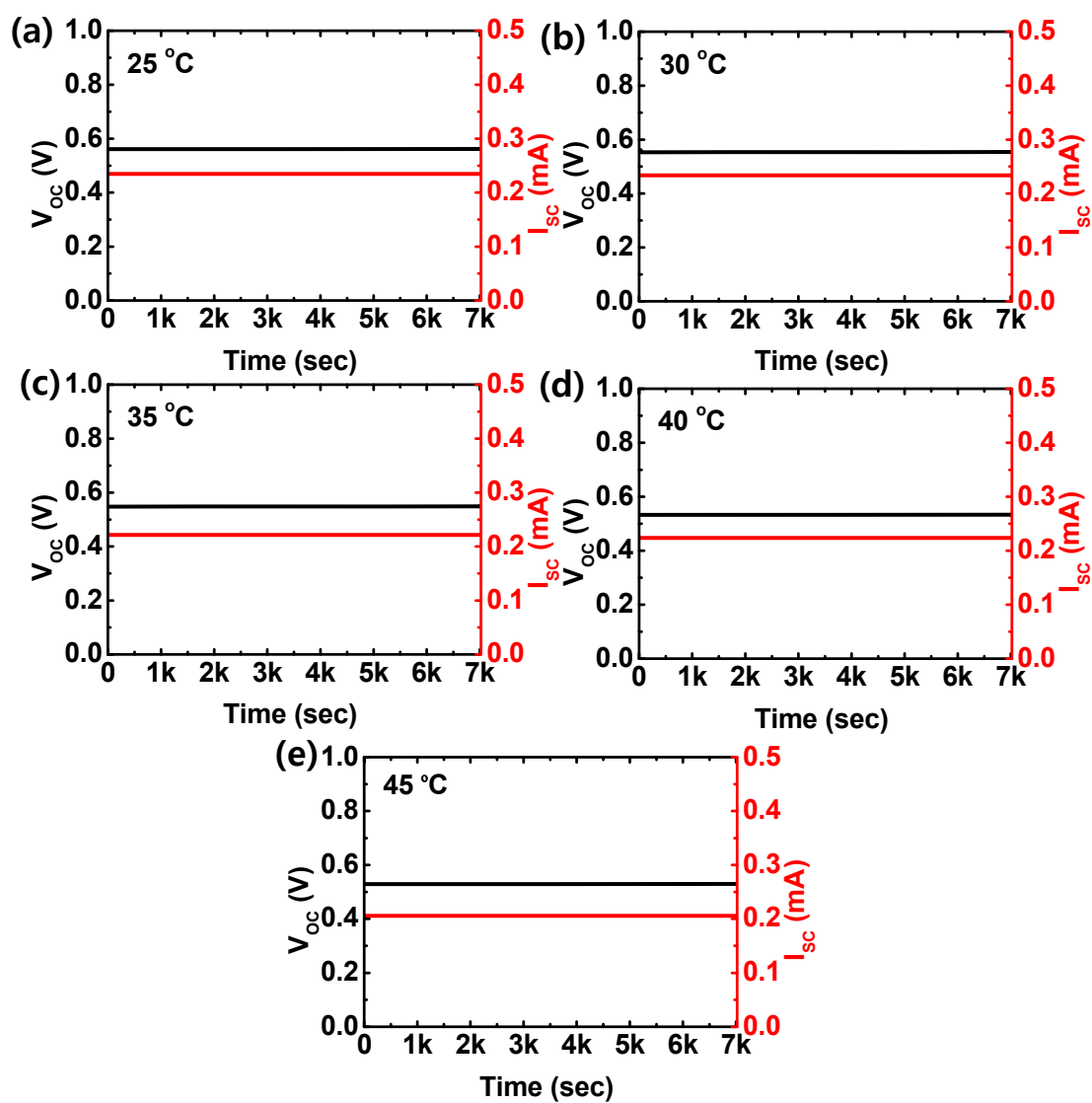


Figure S8. V_{oc} and I_{sc} of $Ti_3C_2T_x$ -gelatin as a function of temperature at 90% RH.

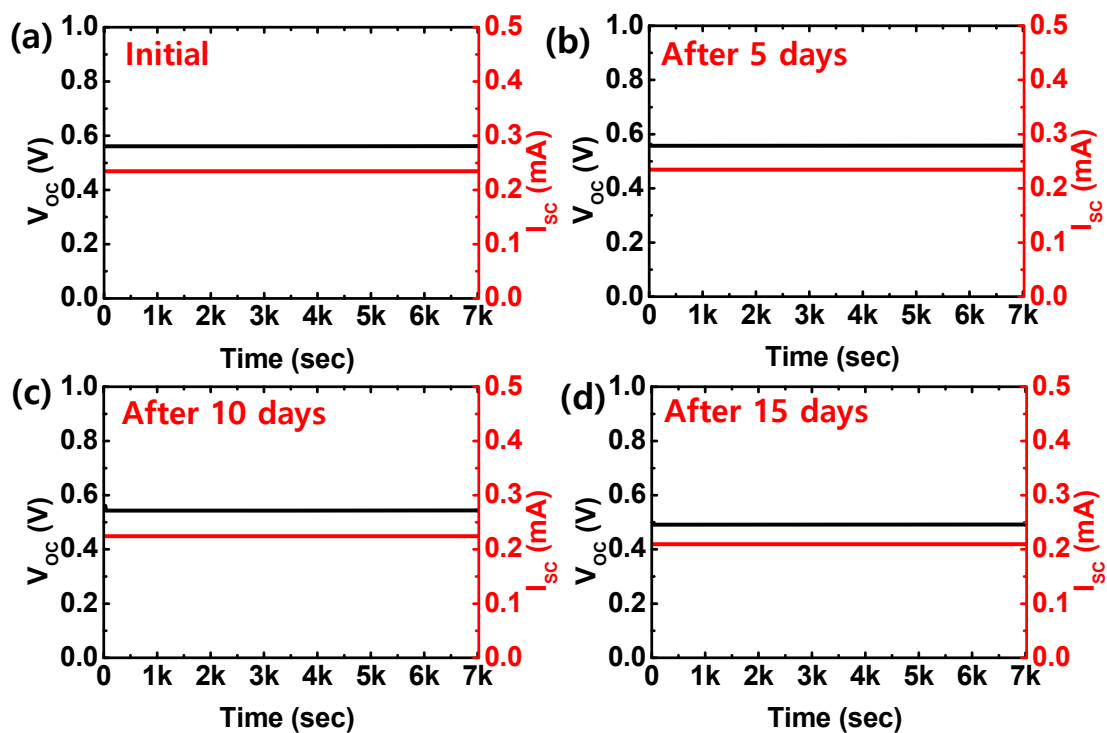


Figure S9. V_{oc} and I_{sc} of $Ti_3C_2T_x$ -gelatin as a function of time (0, 5, 10, and 15 days).

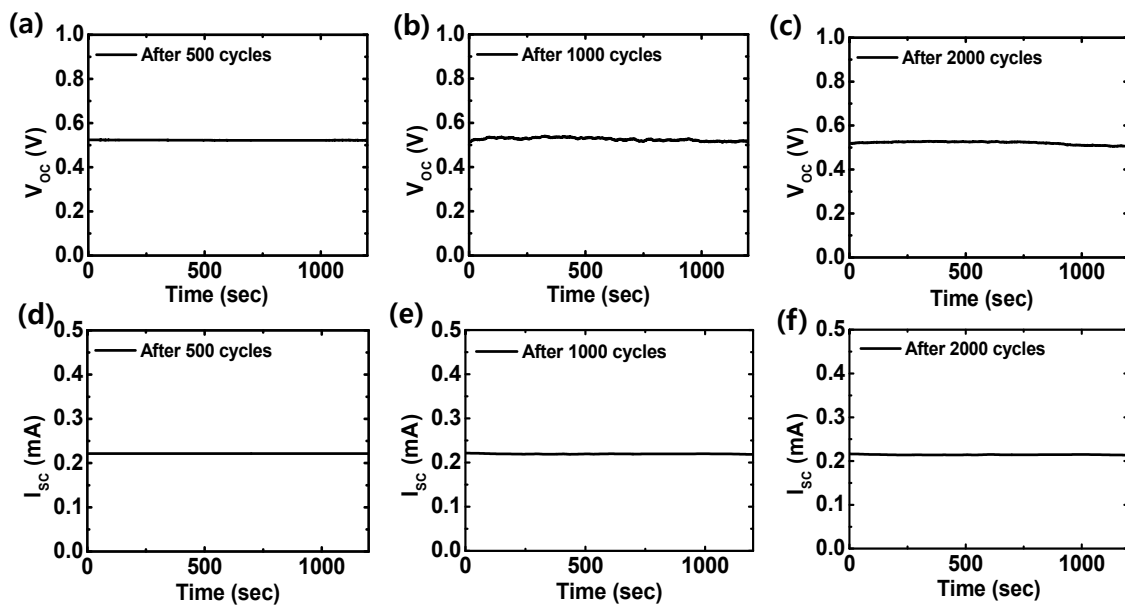


Figure S10. (a) V_{oc} and (d) I_{sc} generated by the flexible humidity sensor after 500 bending cycles at a strain of 40%. (b) V_{oc} and (e) I_{sc} after 1000 bending cycles. (c) V_{oc} and (f) I_{sc} after 2000 bending cycles.

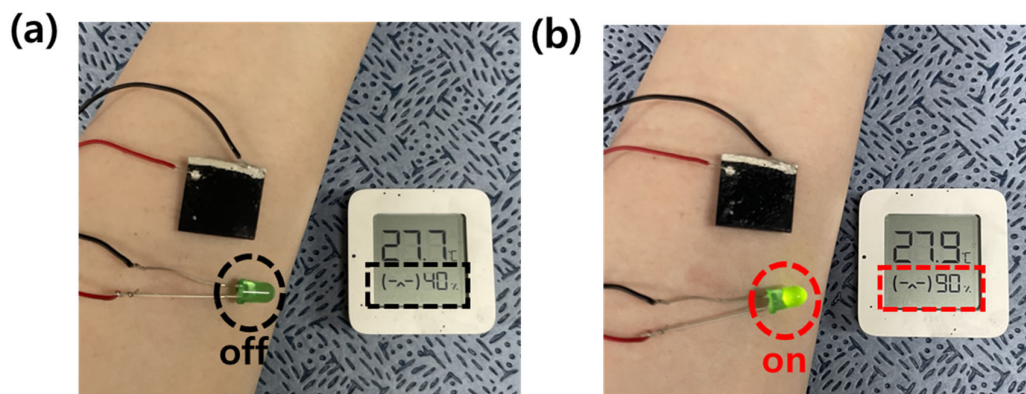


Figure S11. Responses of the proposed moisture-controlled switch attached to the arm: (a)

LED switched off at 40% RH and (b) LED switched on at 90% RH.