Electronic Supplementary Material (ESI) for Journal of Materials Chemistry A.

Supporting Information

Electric power generation by paper materials

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Table S1 Surface elemental composition of print paper.

Elements	Mass %	Atomic %
C	45.57	53.82
O	50.41	44.69
Ti	0.06	0.02
S	0.06	0.03
Ca	3.54	1.25
Cl	0.01	0.00
Al	0.11	0.06
Si	0.14	0.07
Mg	0.09	0.05
Total	100.00	100.00

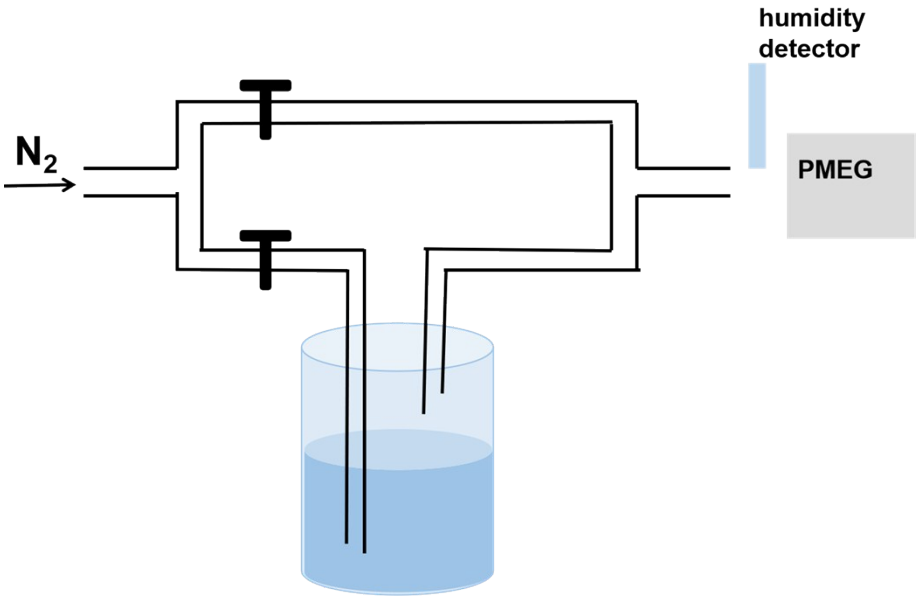

Fig. S1 The schematic diagram of moisture circulating system.

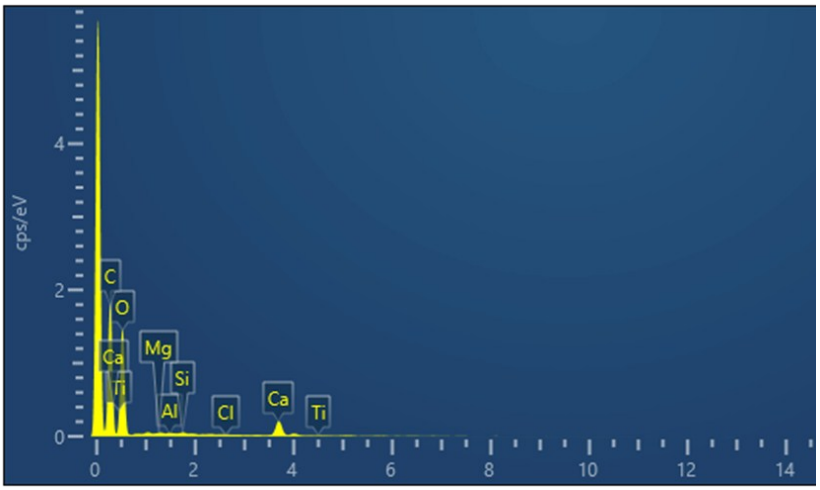

Fig. S2 EDS characterization of print paper.

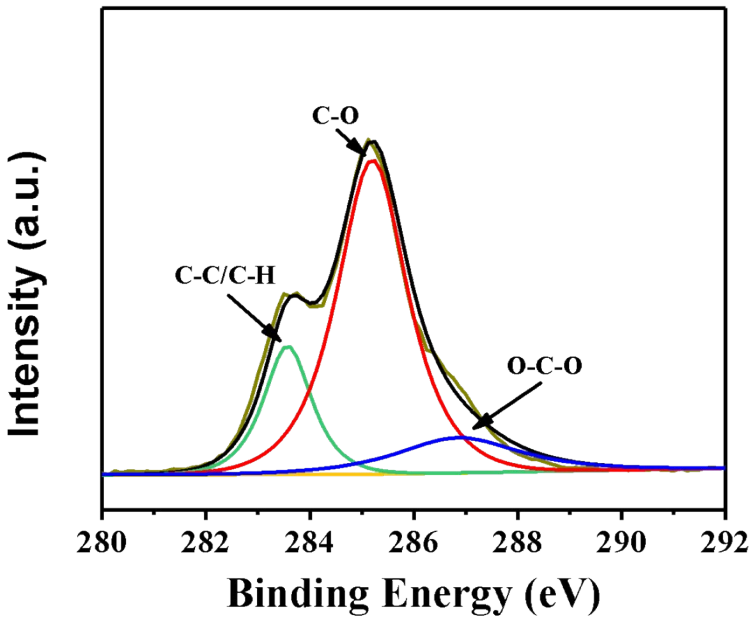

Fig. S3 XPS characterization of print paper.

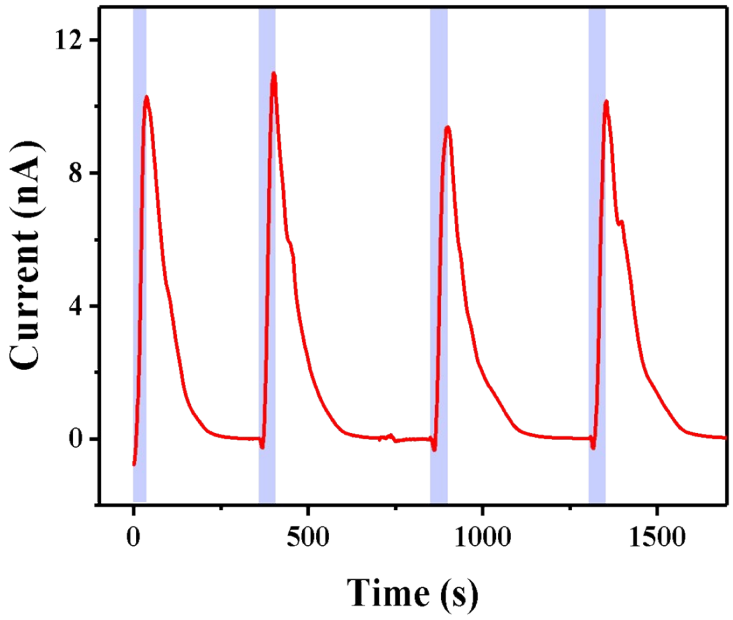

Fig. S4 Generated current of print paper. Hygroelectric material area: 1.5 cm^2, at room temperature with 70% ΔRH.

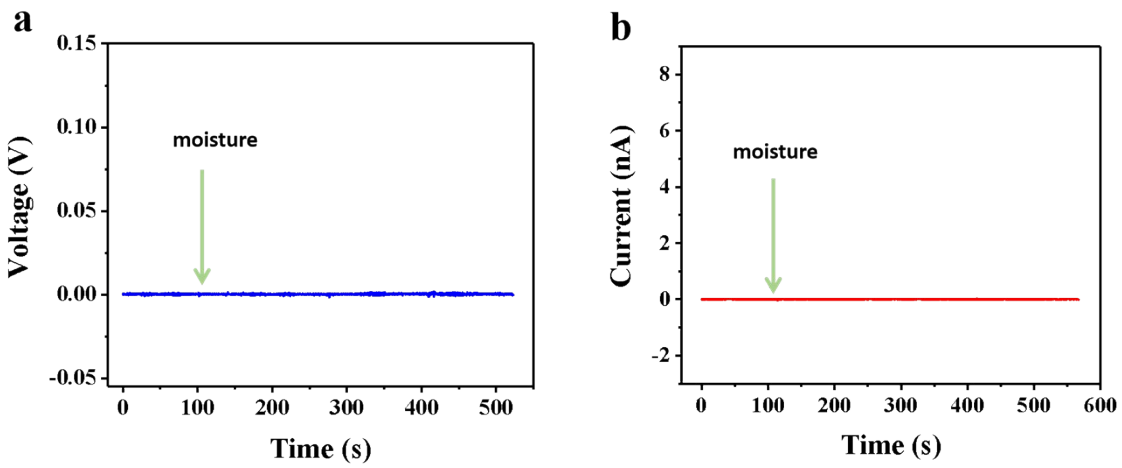

Fig. S5 Generated (a) voltage and (b) current of the PMEG when the paper sheet was removed. Measurements were taken at room temperature with 70% ΔRH.

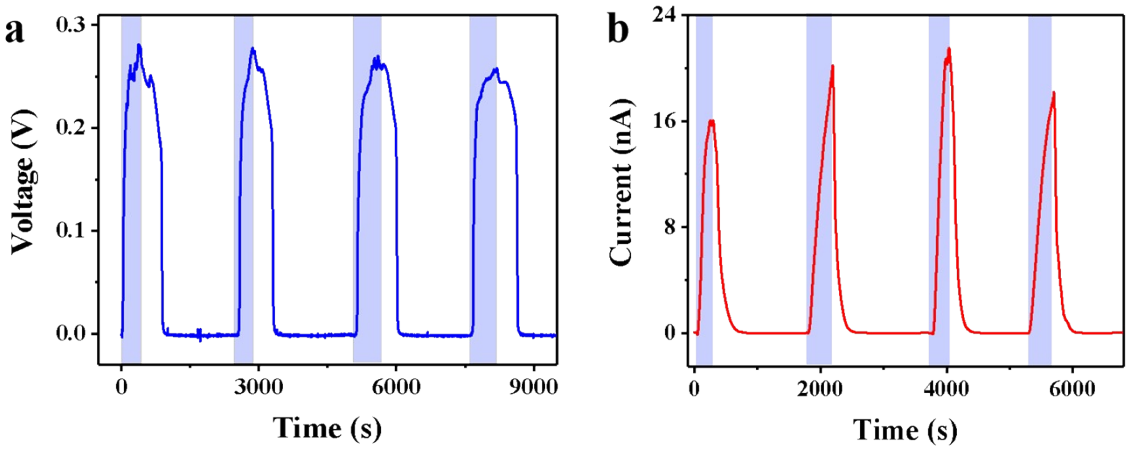

Fig. S6 Generated (a) voltage and (b) current of carboxymethyl cellulose film. Hygroelectric material area: 1.5 cm^2, at room temperature with 70% ΔRH.

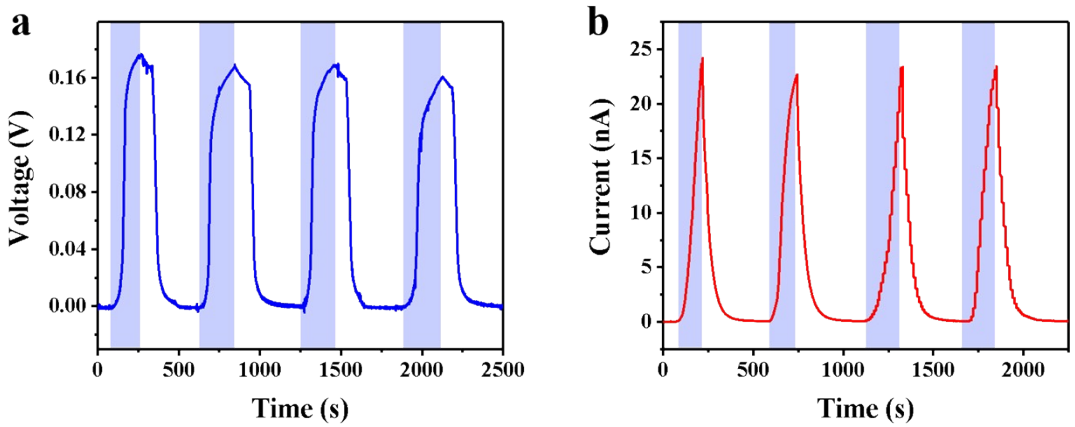

Fig. S7 Generated (a) voltage and (b) current of filter paper. Hygroelectric material area: 1.5 cm^2, at room temperature with 70% ΔRH.

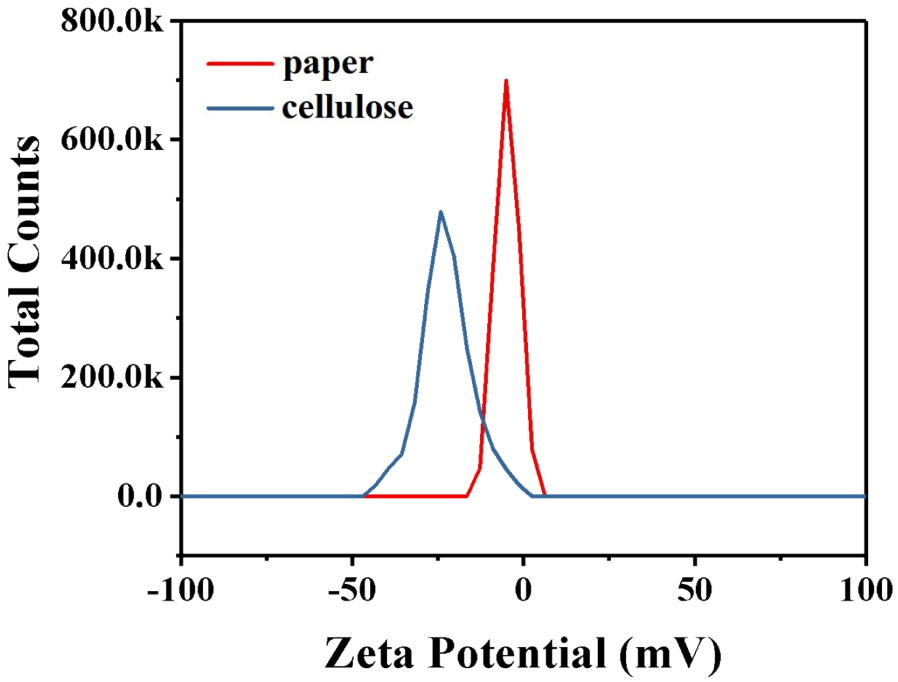

Fig. S8 Zeta Potential of print paper and carboxymethyl cellulose.

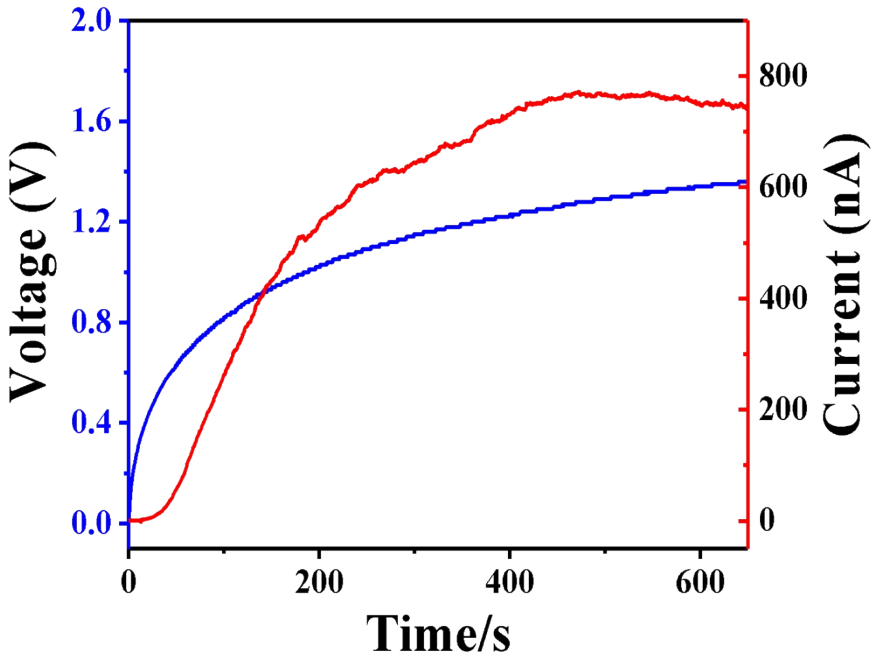

Fig. S9 Generated voltage and current from a pack of five series-connected PMEGs based on acidified print paper.

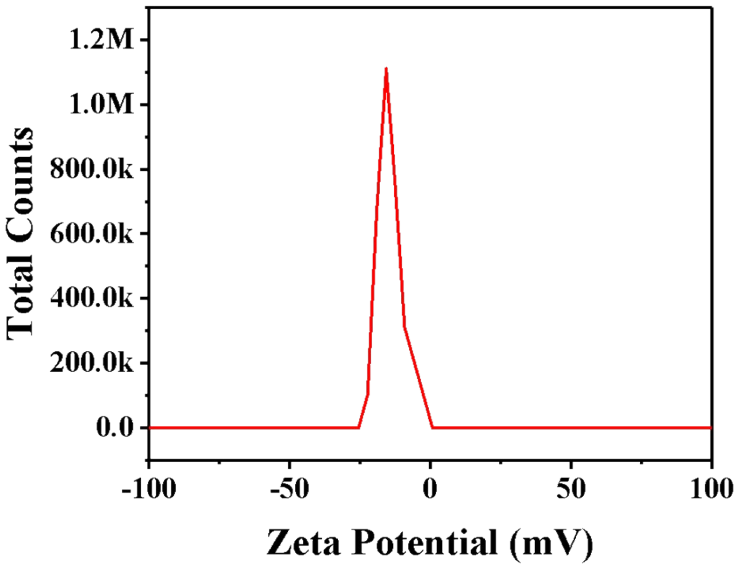

Fig. S10 Zeta potential of acidified print paper.

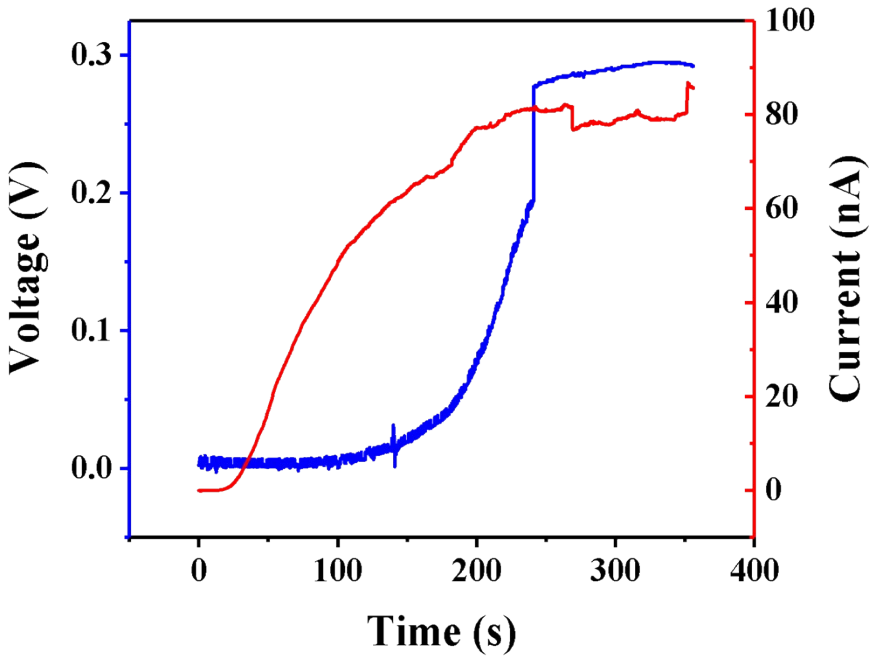

Fig. S11 Generated voltage and current of print paper treated by CH_3CH_2COOH.

Sample area: 1.5cm^2

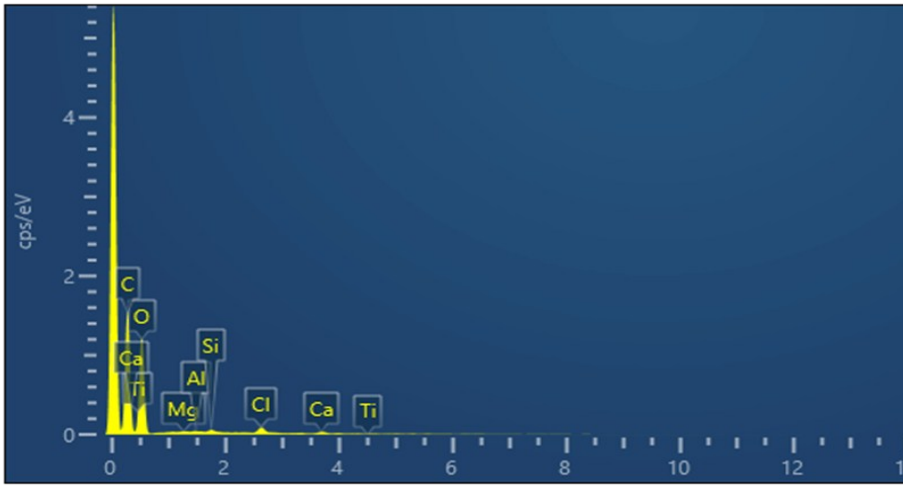

Fig. S12 EDS characterization of acidified print paper.

Table S2 Surface elemental composition of acidified print paper.

Elements	Mass %	Atomic %
C	48.955	56.535
O	49.355	42.795
Ti	0.000	0.000
S	0.010	0.005
Cl	0.900	0.350
Al	0.020	0.010
Si	0.220	0.105
Mg	0.035	0.020
Ca	0.505	0.175
Total	100.00	100.00

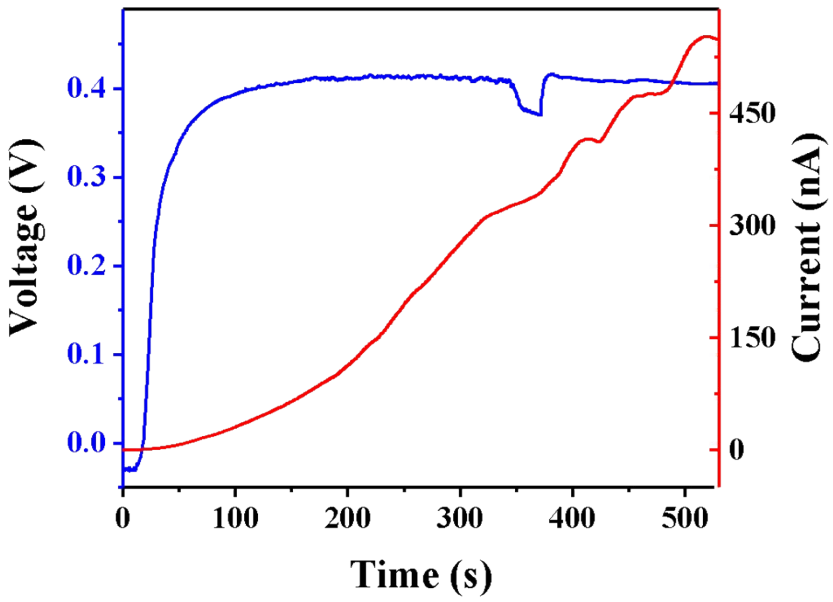

Fig. S13 Generated voltage and current of filter paper treated by 1M HCl solution. Hygroelectric material area: 1.5 cm^2

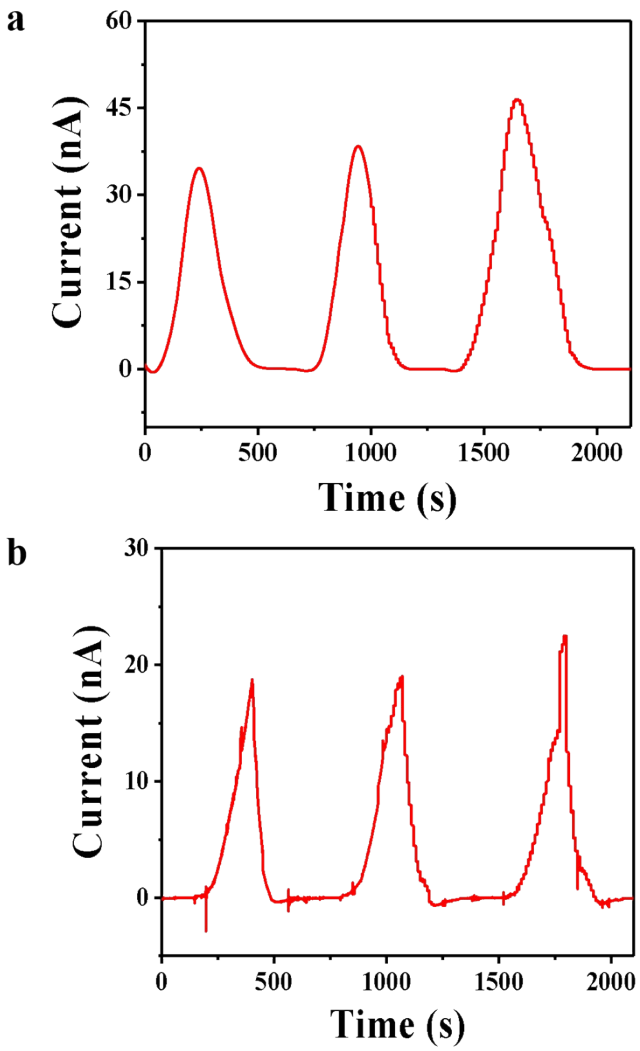

Fig. S14 (a) Generated current of paper crane. (b) Generated current of paper fan. Sample area: 1.5cm^2

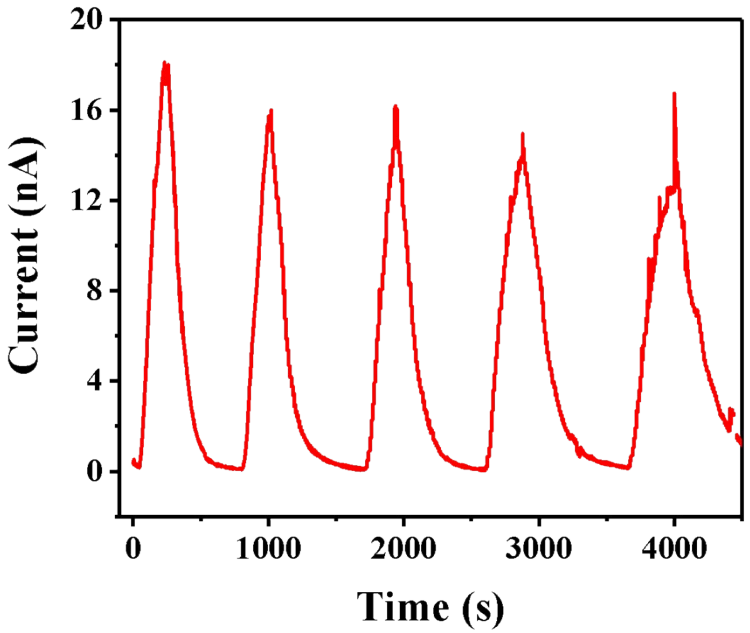

Fig. S15 Generated current of one PMEG unit.

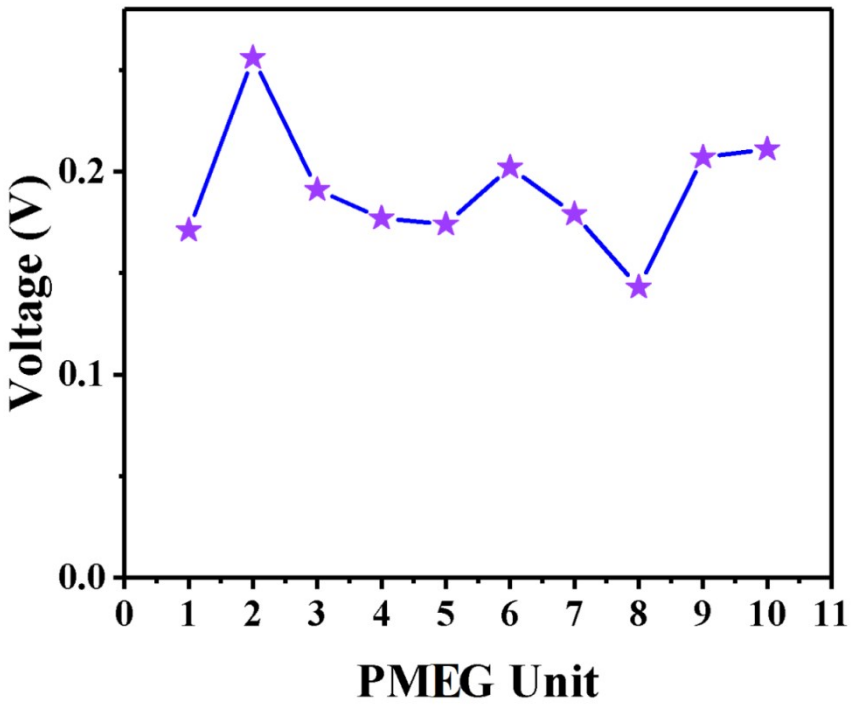

Fig. S16 Generated voltage of every PMEG unit.

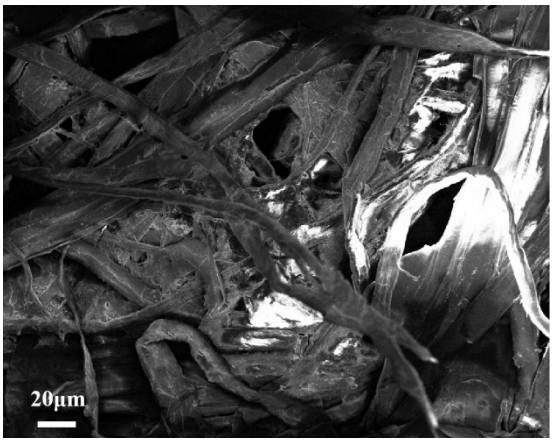

Fig. S17 SEM image of rice paper showing that rice paper has larger holes than print paper (shown in Fig. 1d).