

Supplementary Information

Re-shaping graphene hydrogels for effectively enhancing actuation responses

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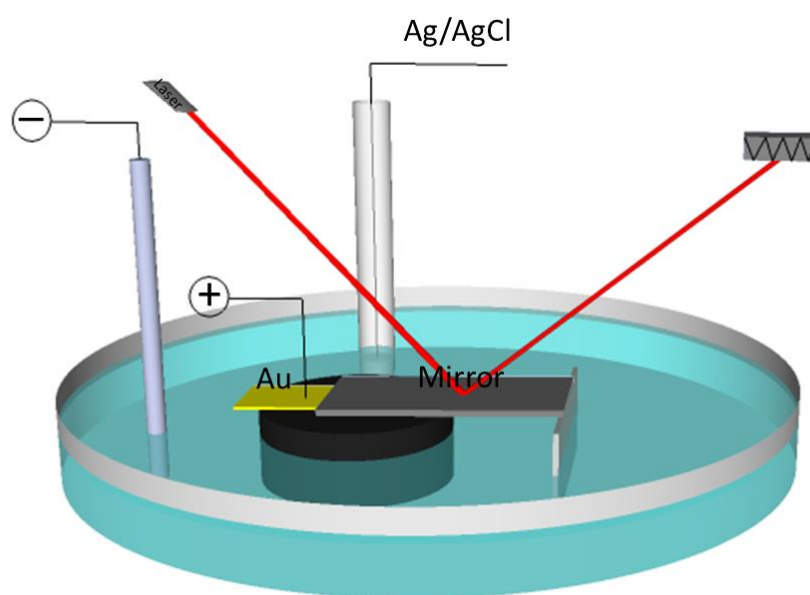


Fig. S1 The apparatus used for measuring the actuation responses of as-prepared GH, RSGH, G-PH or RG-PH samples. The sample keeps in contact with Au foils the working electrode. A Pt wire counter electrode and Ag/AgCl reference electrode are separately located in the electrolyte.

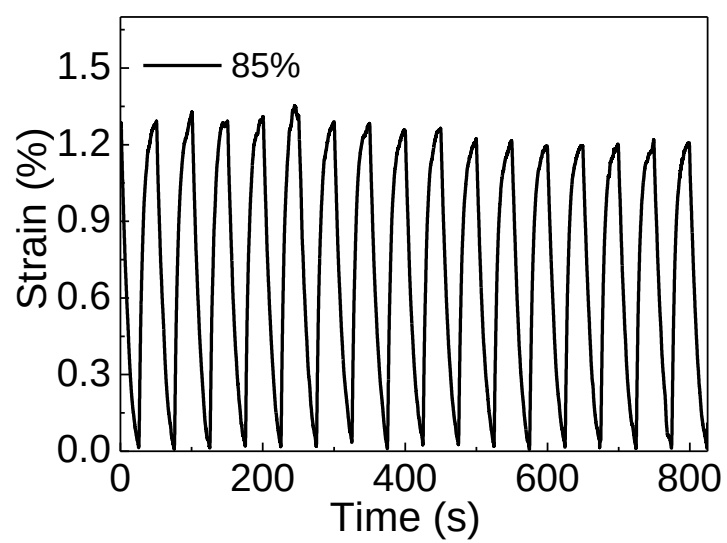


Fig. S2 Actuation behavior of the 85% RSGHs under applied square wave potential of 0.8 V with a cycle time of 50 s prolonged to 800s.

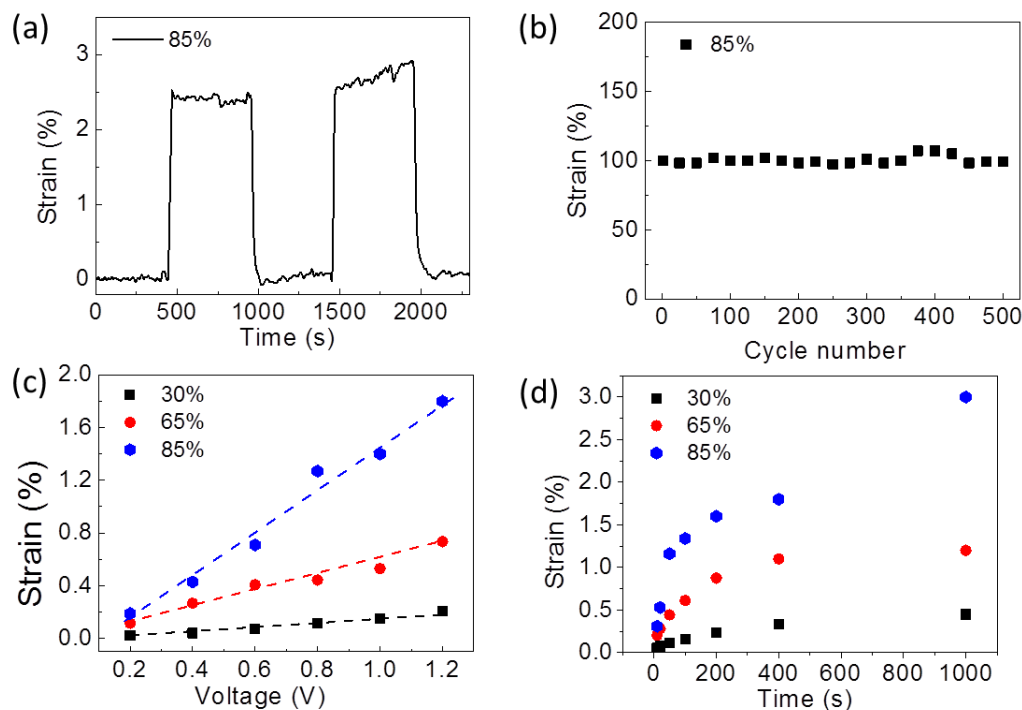


Fig. S3 (a) The strain responses of the 85% RSGH actuator at an applied square wave potential of 0.8 V with a cycle time of 1000s. (b) The actuation durability of 85% RSGH actuator. (c) and (d) are the corresponding curve of strain change as a function of applied voltages and cyclic period, respectively.

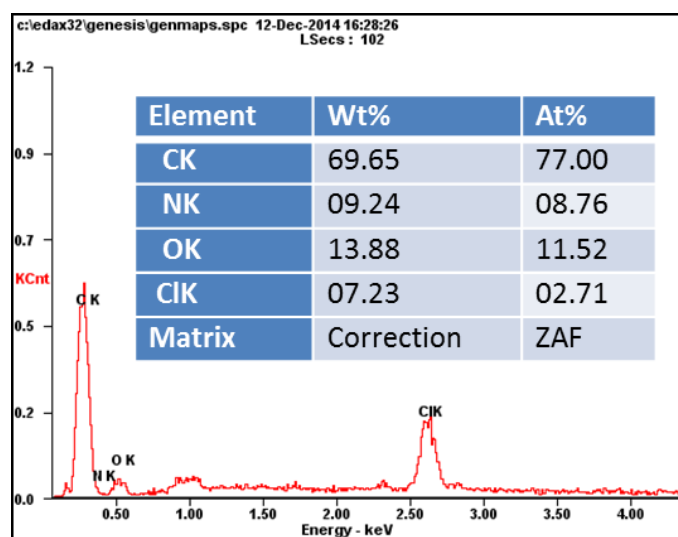


Fig. S4 EDS spectrum of the G-PH.

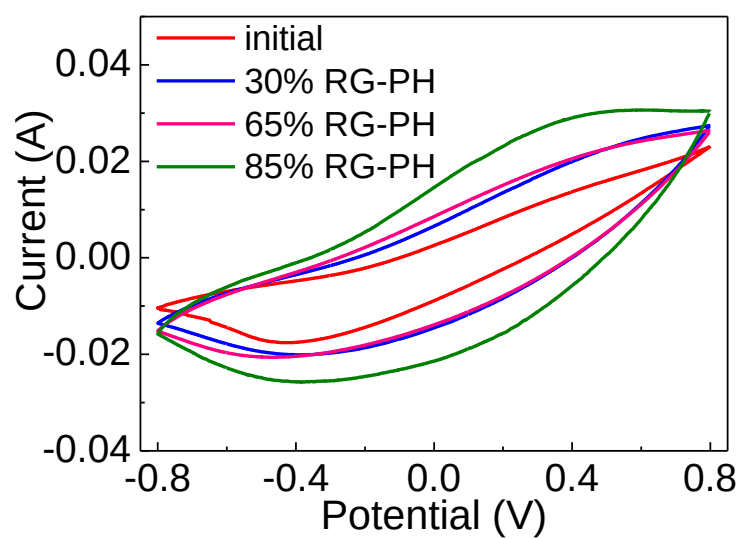


Fig. S5 Cyclic voltammogram of G-PH and RG-PH.

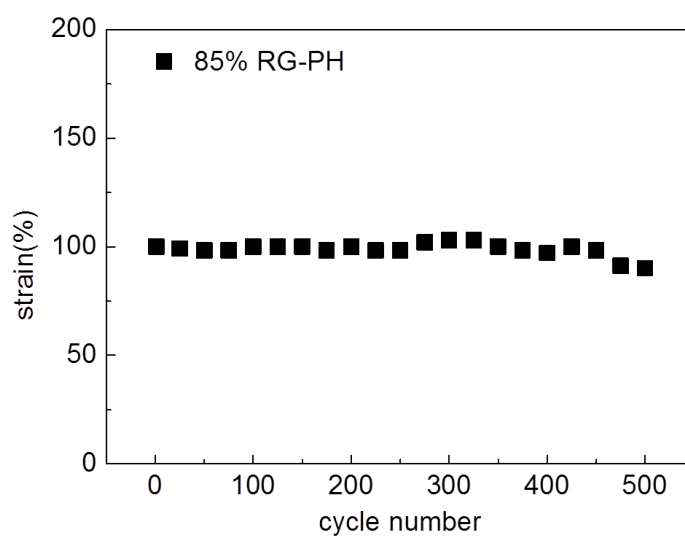


Fig. S6 The actuation durability data for the 85% RG-PH actuator.

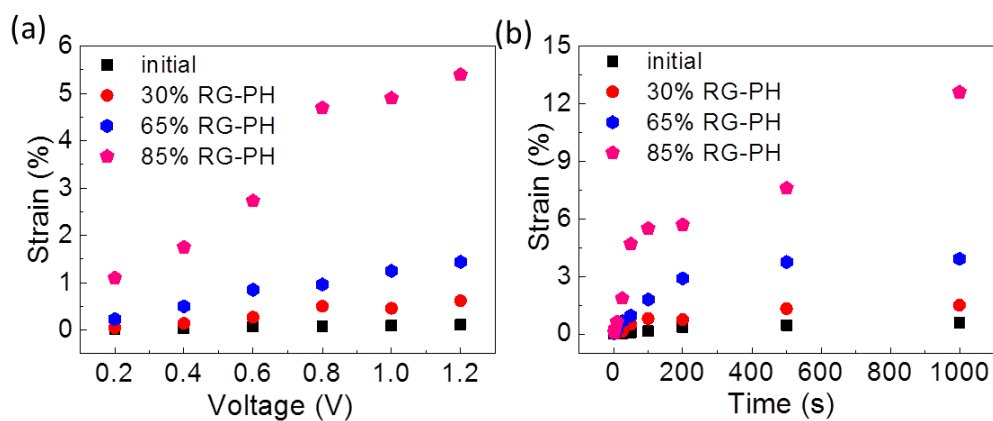


Fig. S7 (a) and (b) are curves of the strain change as a function of applied voltages and cyclic period, respectively, for the 85% RG-PH actuator.

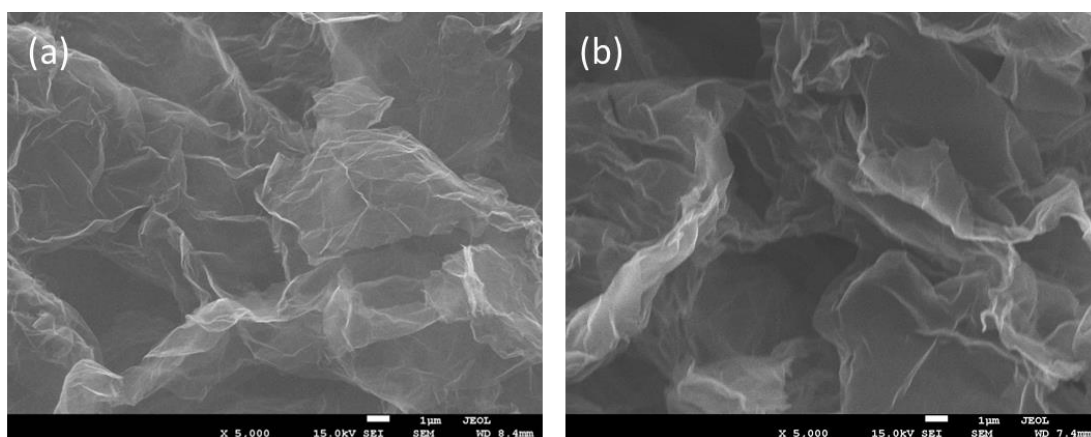


Fig. S8 The initial G-PH (a) and applied + 0.8V voltage for 2h on it (b).

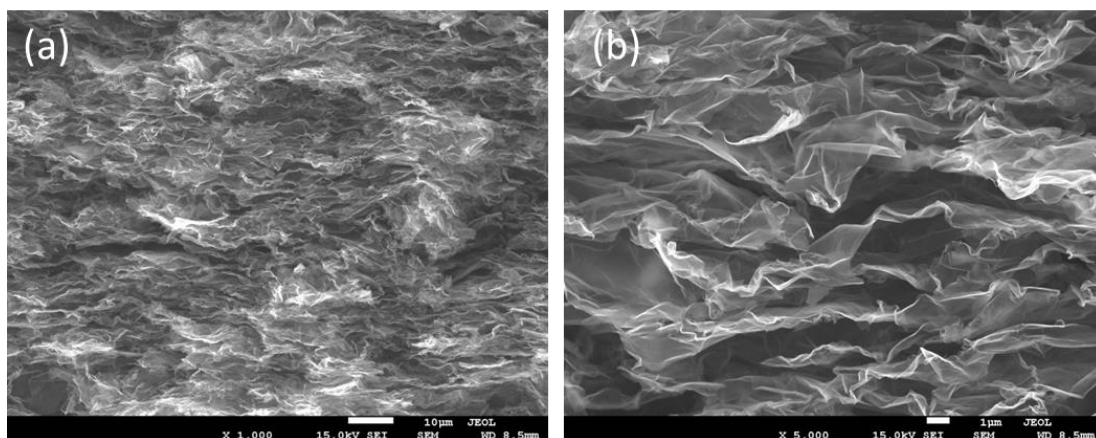


Fig. S9 85% RG-PH applied -0.8V voltage for 2h on it.

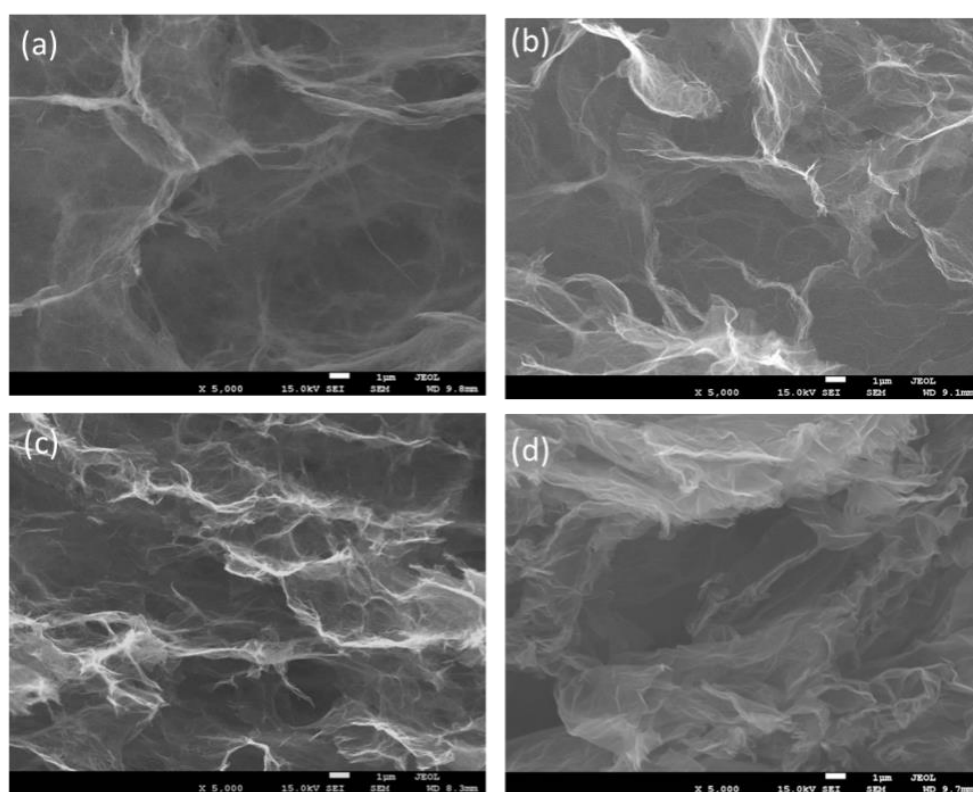


Fig. S10 Initial GH (a) and applied -0.8V voltage for 2h on it (b). 85% RSGH (c) and applied -0.8V voltage for 2h on it (d).

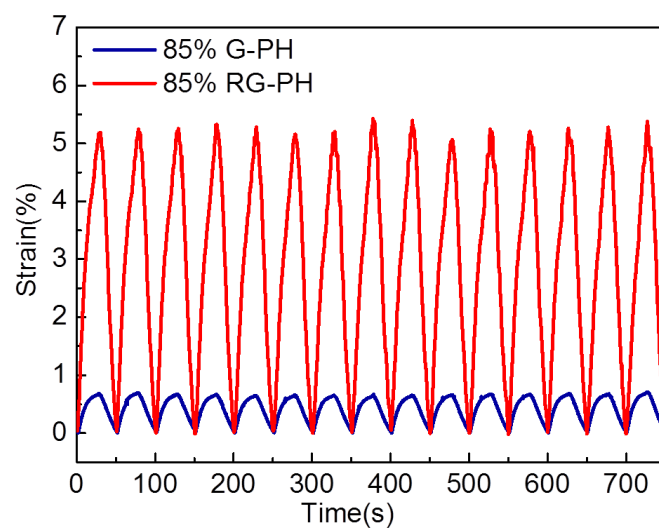


Fig. S11 Actuation responses of the 85% G-PH and 85% RG-PH under applied square wave potential of 0.8 V with a frequency of 0.02 Hz.