Supporting information

Stretchable Gold Fiber-Based Wearable Electrochemical Sensor toward pH Monitoring

*Ren Wang[1,2], Qingfeng Zhai[1,2], Yunmeng Zhao[1,2], Tiance An[1,2], Shu Gong[1,2], Zhirui Guo[1,2], QianQian Shi[1,2] , Zijun Yong[1,2], Wenlong Cheng[1,2]**

[1]Department of Chemical Engineering, Faculty of Engineering, Monash University, Clayton 3800, Victoria, Australia.

[2]The Melbourne Centre for Nanofabrication, 151 Wellington Road, Clayton 3168, Victoria, Australia.

* Address correspondence to wenlong.cheng@monash.edu

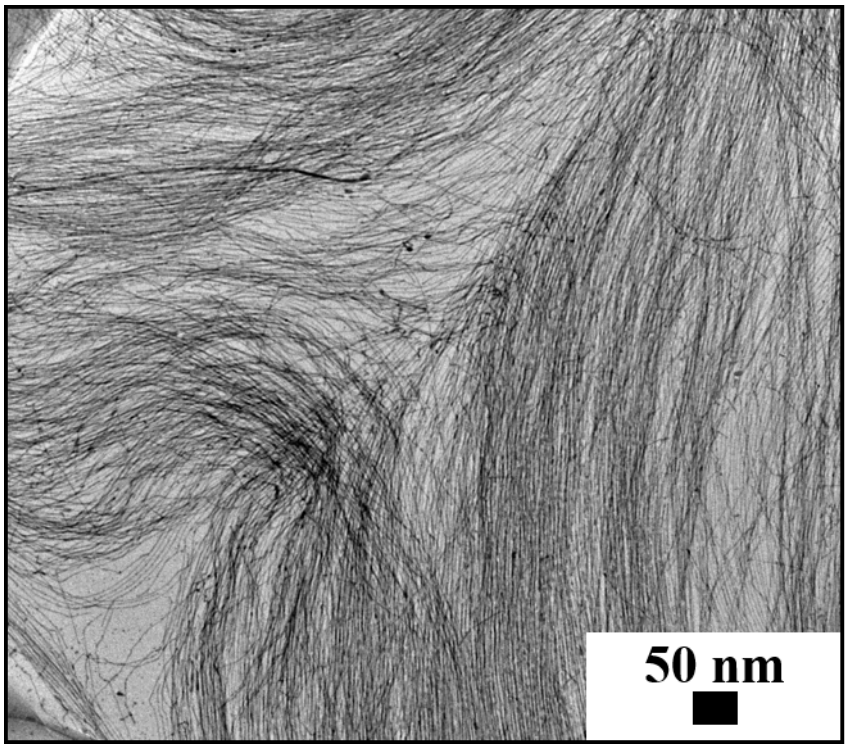

Figure S1. TEM image of OA capped AuNWs with 2 nm diameter.

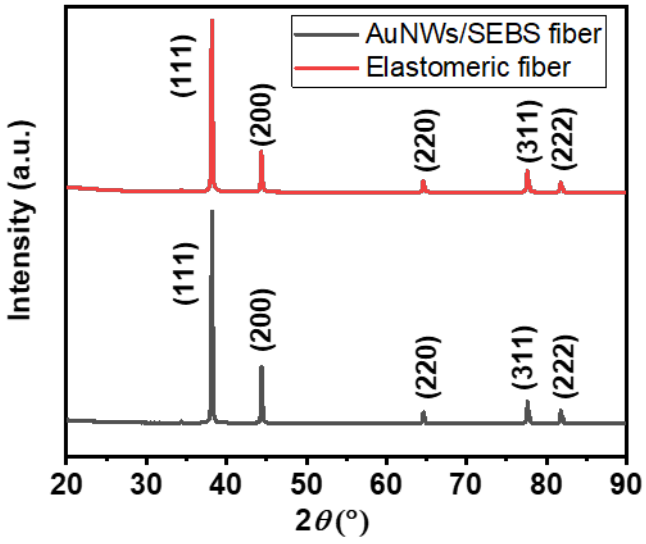

Figure S2. XRD image of gold fiber before and after Au film growth, named AuNWs/SEBS fiber and elastomeric fiber, respectively.

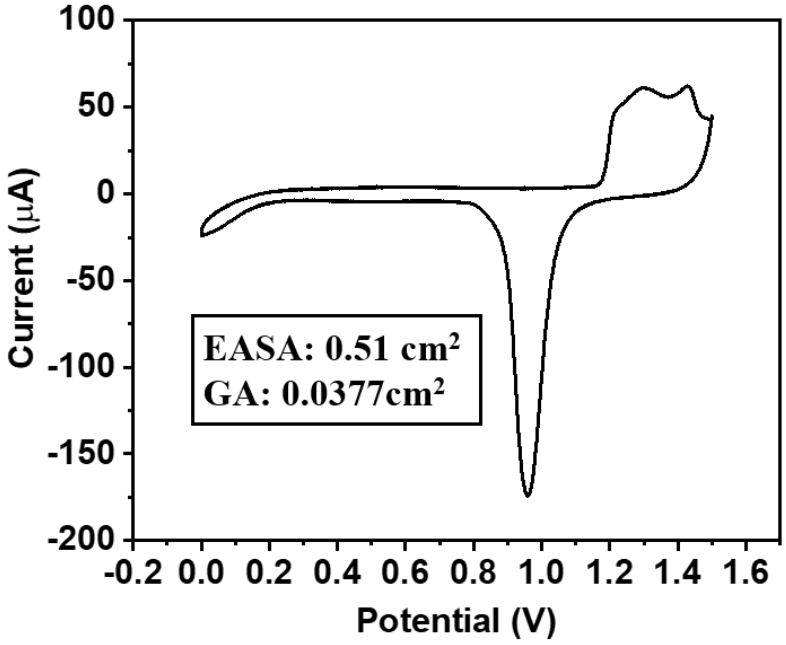

Figure S3. The CV curve of elastomer Au fiber in 1 M H_2SO_4 at 0.1 V/s, which shows large EASA at 0.51 cm^2 compared with geometry area at 0.0377cm^2.

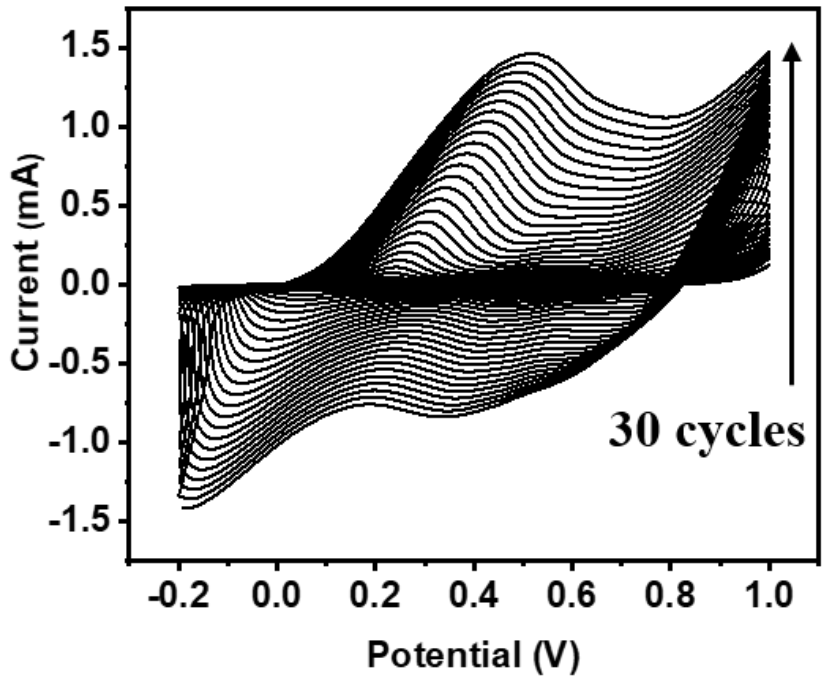

Figure S4. CV curve of the process of PANI electrodeposition onto gold fiber surface at 0.1 V/s for 30 cycles.

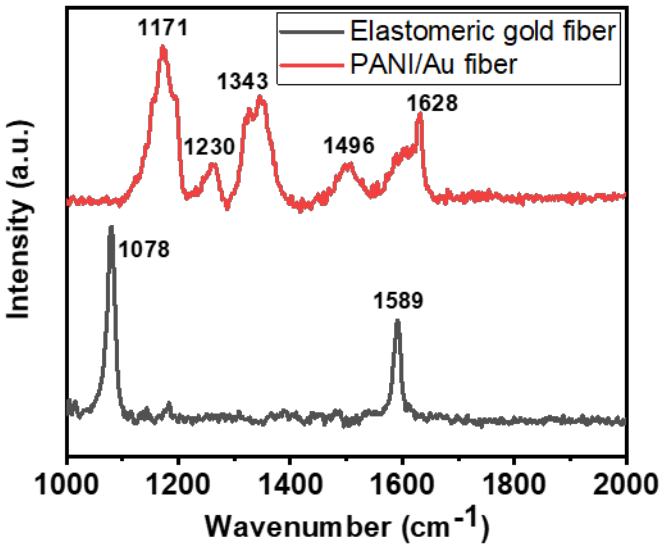

Figure S5. Raman spectra of elastomeric gold fiber and PANI/Au fiber electrodeposition under 830 nm laser.

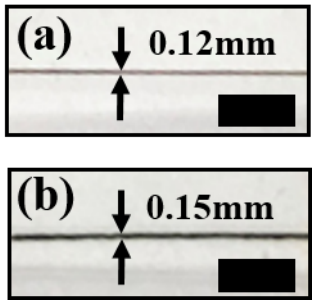

Figure S6. The digital image of pH-sensing working electrode before (a) and after (b) PANI electrodeposition process, respectively. Scale bar: 4 mm.

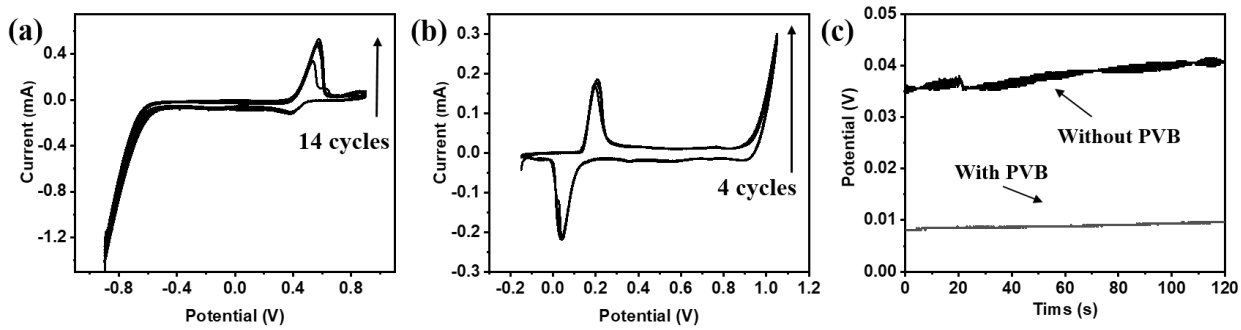

Figure S7. (a) The CV curve of the process of Ag electrodeposition onto gold fiber surface at 0.1 V/s for 14 cycles. (b) The CV curve of the Ag chlorination process on fiber surface at 0.05 V/s for 4 cycles. (c) The open circuit potential performance of Au/Ag/AgCl reference electrode with/without PVB coated.

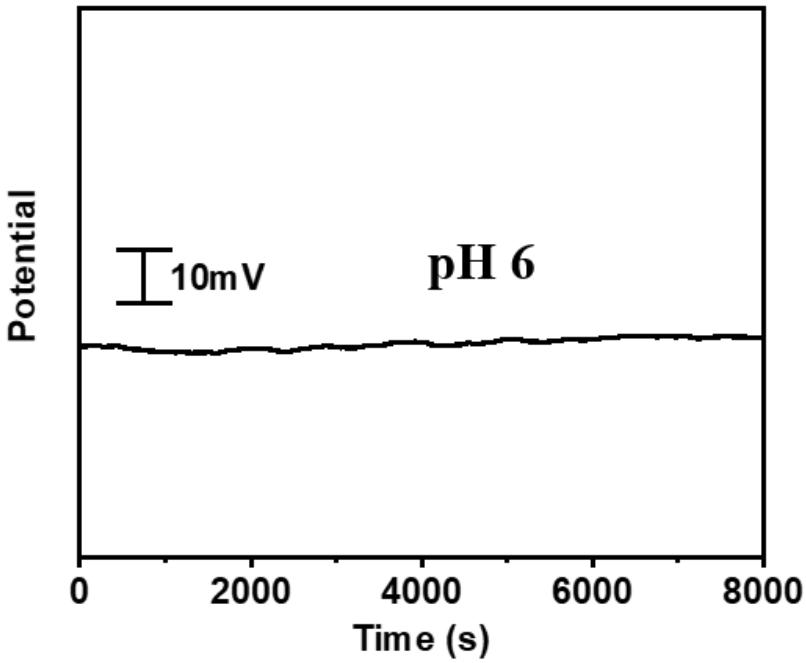

Figure S8. The operation stability of fiber-based pH sensor at pH 6 for 8000 seconds.

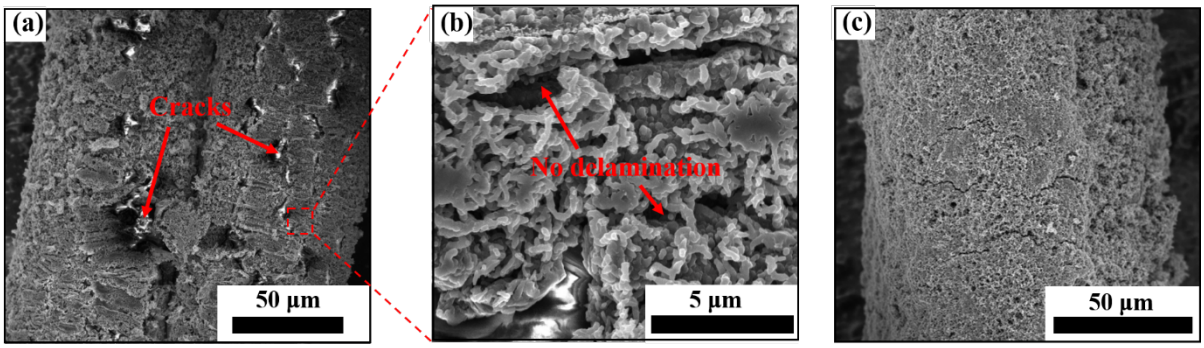

Figure S9. (a) SEM image of PANI structure on the surface of gold fiber at 100% stretching state with some cracks. (b) SEM image of PANI structure at 100% stretching state without delamination from Au film. (c) SEM image of PANI structure after releasing to initial length with infinitesimal cracks.

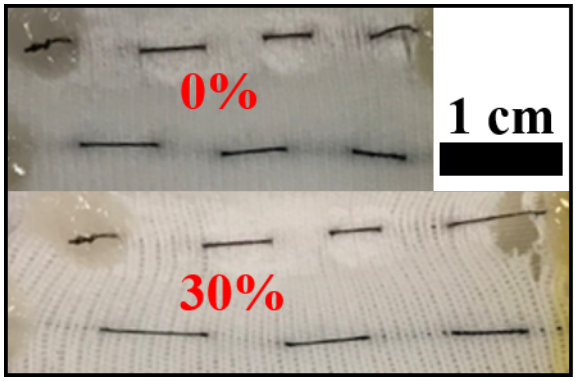

Figure S10. The digital image of wearable electrochemical smart pH textile at initial length (top) and at 30% stretching (bottom).

Table S1. Comparison of wearable PANI based flexible electrochemical pH sensors.

Materials	Platform	Sensitivity (mV/pH)	Flexibility	Stretch-ability	Ref.
Carbon/PANI	Tattoo paper	50.1	Yes	No	1
Au/PANI	PET patch	62.5	Yes	No	2
Graphene/Au mesh/PANI	Silicon patch	71.8	Yes	30%	3
Au Nano-sheets/CNTs/PANI	PDMS patch	71.44	Yes	30%	4
CNT/PANI	CNT fiber	35*	Yes	No	5
Carbon paste/ Ag ink/PANI	PET patch	54.2	Yes	No	6
Au films/PANI	SEBS/gold fiber	60.6	Yes	100%	This work

* The sensitivity of the pH sensor was not given.

References

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