Supplementary Information:

Electrode-integrated textile-based sensors for in situ temperature and relative humidity monitoring in electrochemical cells

Sadegh Hasanpour[a,b,c], Armin Rashidi[d], Tavia Walsh[a,b], Erik Pagan[a], Abbas S. Milani[d], Mohsen Akbari[a,b*], Ned Djilali[c,e]

[a]Laboratory for Innovations in Microengineering (LiME), Department of Mechanical Engineering, University of Victoria, Victoria, BC V8P 5C2, Canada.

[b]Biotechnology Center, Silesian University of Technology, Akademicka 2A, 44-100 Gliwice, Poland.

[c]Department of Mechanical Engineering and Institute for Integrated Energy System, University of Victoria, Victoria, BC V8W 3P6, Canada.

[d]Composites Research Network-Okanagan Node (CRN), School of Engineering, University of British Columbia, 3333, University Way, Kelowna, BC V1V 1V7, Canada

[e]Institute of Engineering Thermophysics, School of Energy and Power Engineering, Chongqing University, Chongqing 400030, China

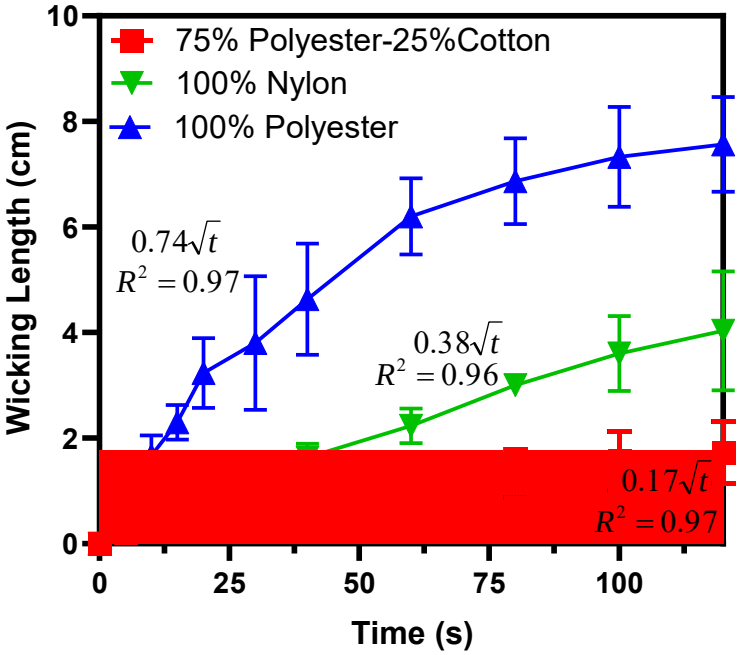

Figure S1- Wicking test for three commercial threads (after Corona discharge treatment). Thread wetting followed a square root of time and the polyester thread showed the highest wicking property.

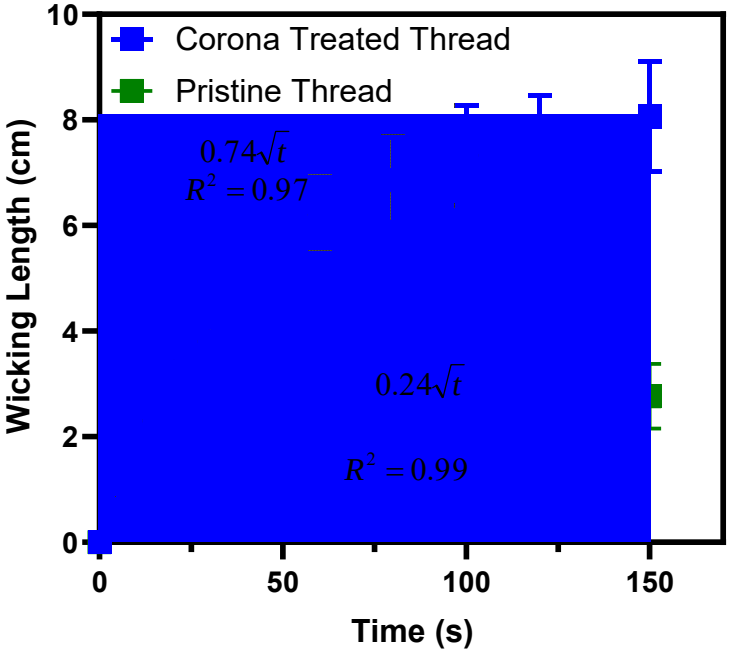

Figure S2- Effect of Corona discharge on wicking property of polyester thread.

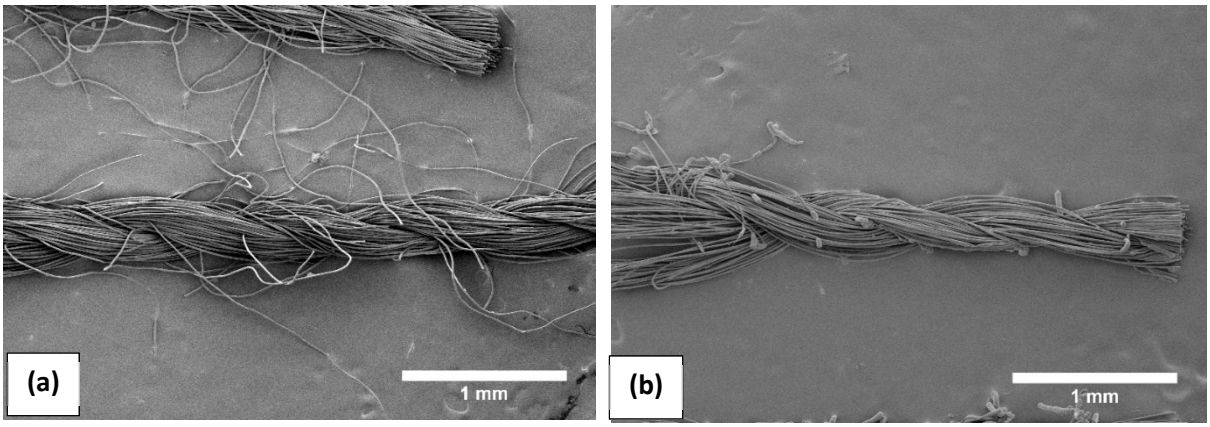

Figure S3- Effect of Corona discharge on the microstructure of thread (a) before treatment, (b) after treatment.

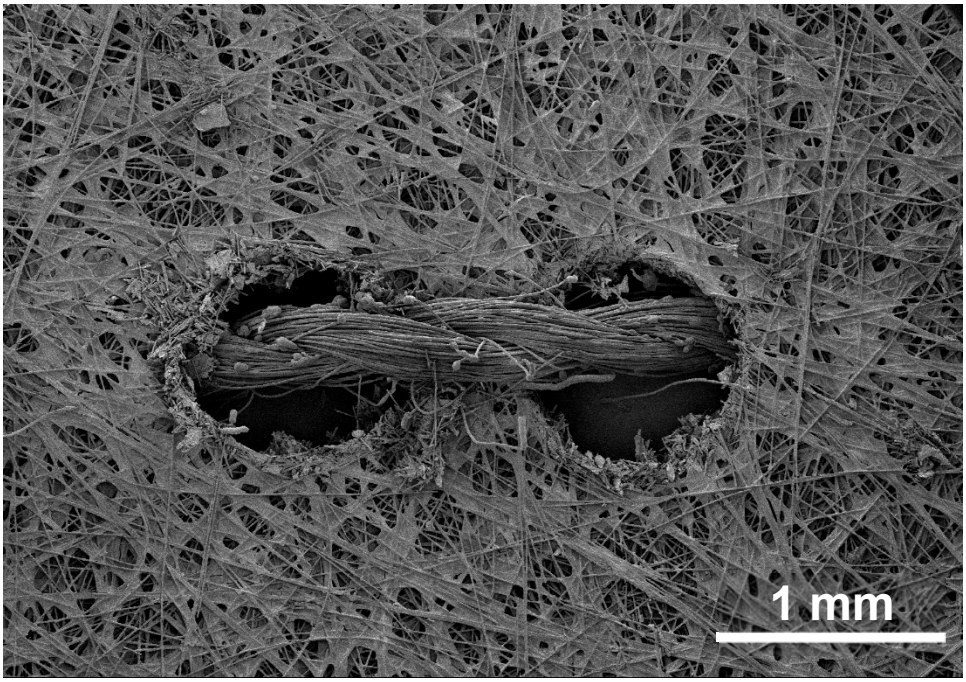

Figure S4 - Effect of sewing thread on non-woven GDL (Toray 090).

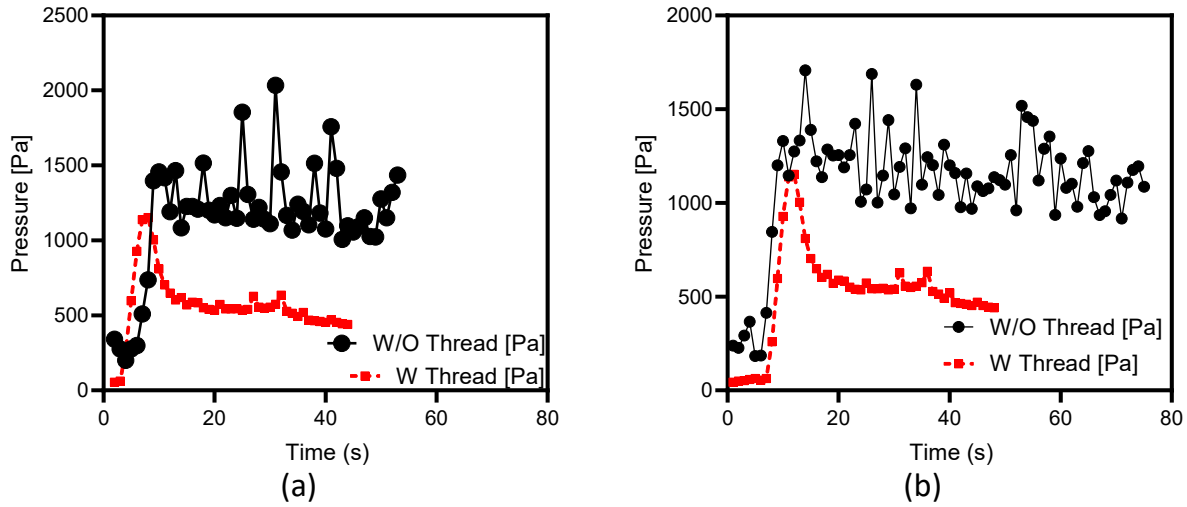

Figure S5 - Two replicates of breakthrough pressure for carbon cloth GDL with and without thread in (a) and (b).

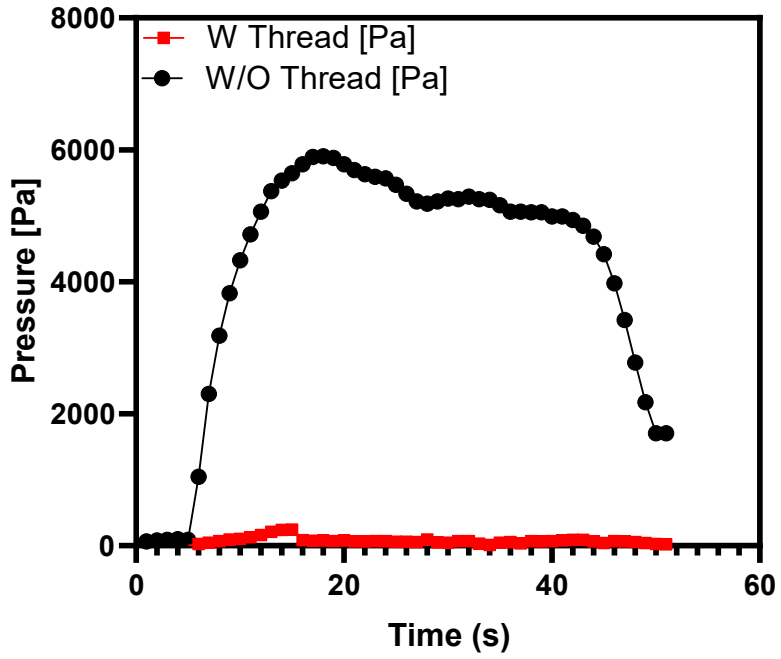

Figure S6- Effect of sewing thread on breakthrough pressure of non-woven GDL vs pristine non-woven GDL.

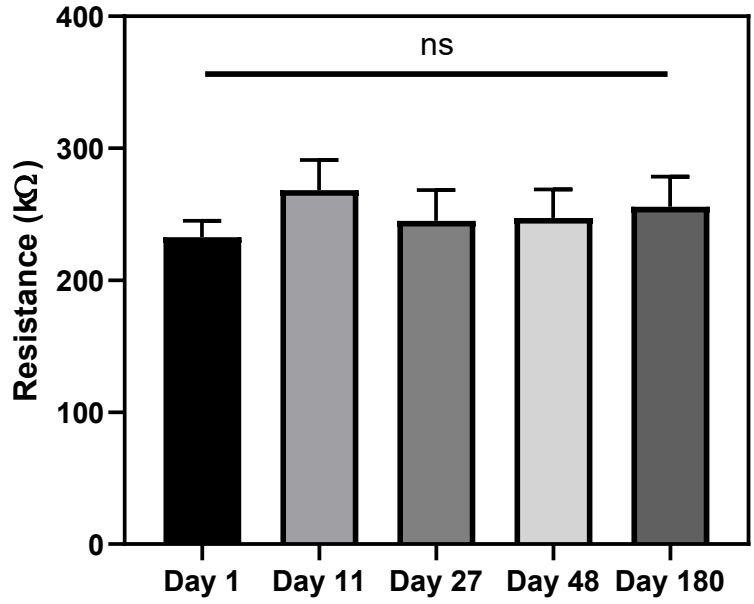

Figure S7 - Resistance of 3 cm long CNT-coated thread for over six months (number of samples is 3).

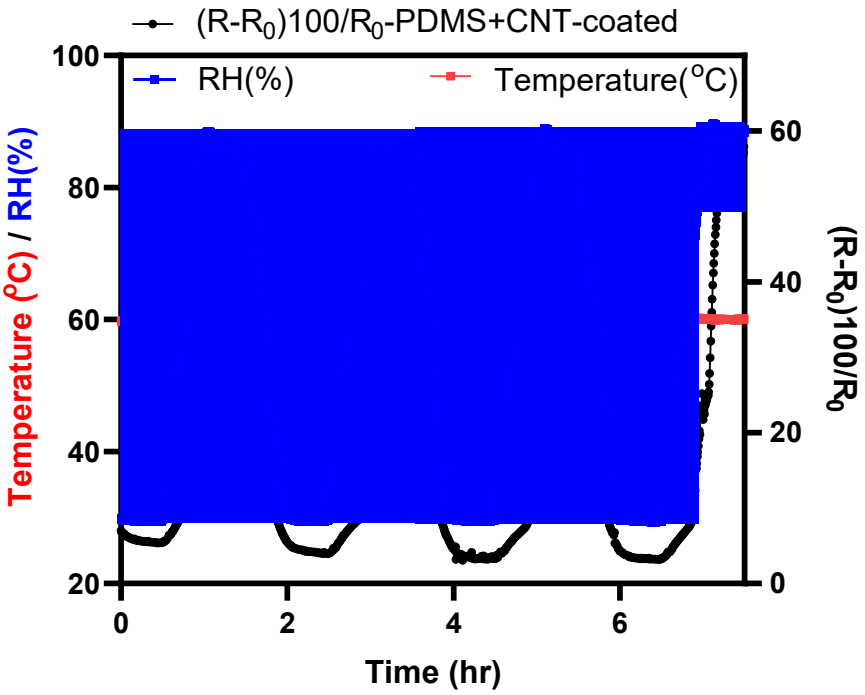

Figure S8 - Cyclic response to RH changes for thread-based RH sensor (PDMS+CNT-coated).

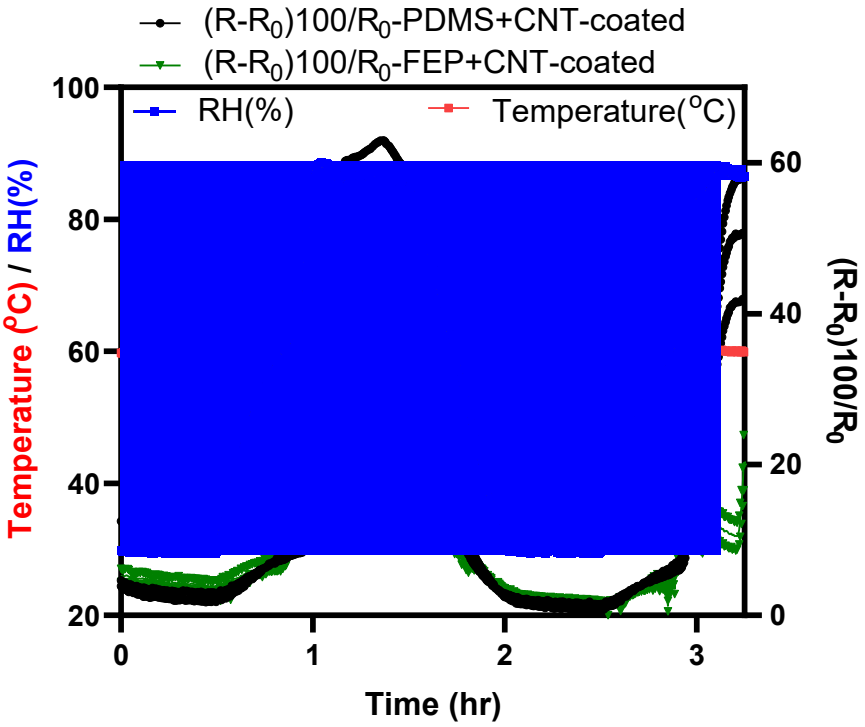

Figure S9 - Cyclic RH response for three replicates of thread bases temperature and RH sensors.