Supplementary Information for

Electro-Conductively Deposited Carbon Fiber for Power Controllable Heating Element

Chang Hyo Kim[1], Moo Sung Kim[1], Yoong Ahm Kim[1, 2, 3,*], Kap Seung Yang[1, 2**], Seung Jo Baek[4], Young-Jun Lee[4], Cheol-Min Yang[5], Yang Jin Lee[5], Jun Yeon Hwang[5]

[1] Department of Polymer Engineering, Graduate School, Chonnam National University, 77 Yongbong-ro, Buk-gu, Gwangju 500-757, Korea

[2] School of Polymer Science and Engineering and Alan G. MacDiarmid Energy Research Institute, Chonnam National University, Yongbong-ro, Buk-gu, Gwangju, 500-757, Korea

[3] Institute for Biomedical Sciences, Interdisciplinary Cluster for Cutting Edge Research, Asahi 3-1-1, Matsumoto, Nagano 390-8621, Japan

[4] HAE Research Laboratory, LG Electronics, 327-23, Gasan-dong, Geumcheon-gu, Seoul, 153-802, Korea

[5] Institute of Advanced Composite Materials, Korea Institute of Science and Technology (KIST), Eunha-ri San 101, Bongdong-eup, Wanju-gun, Jeollabukdo 565-905, Korea

*Corresponding authors: (Y.A.K.) Tel: +82-62-530-1871. Fax: +82-62-530-1779. E-mail: yak@jnu.ac.kr

** Corresponding author: (K.S.Y.) Tel: +82-62-530-1774, Fax: +82-62-530-1779, E-mail: ksyang@jnu.ac.kr

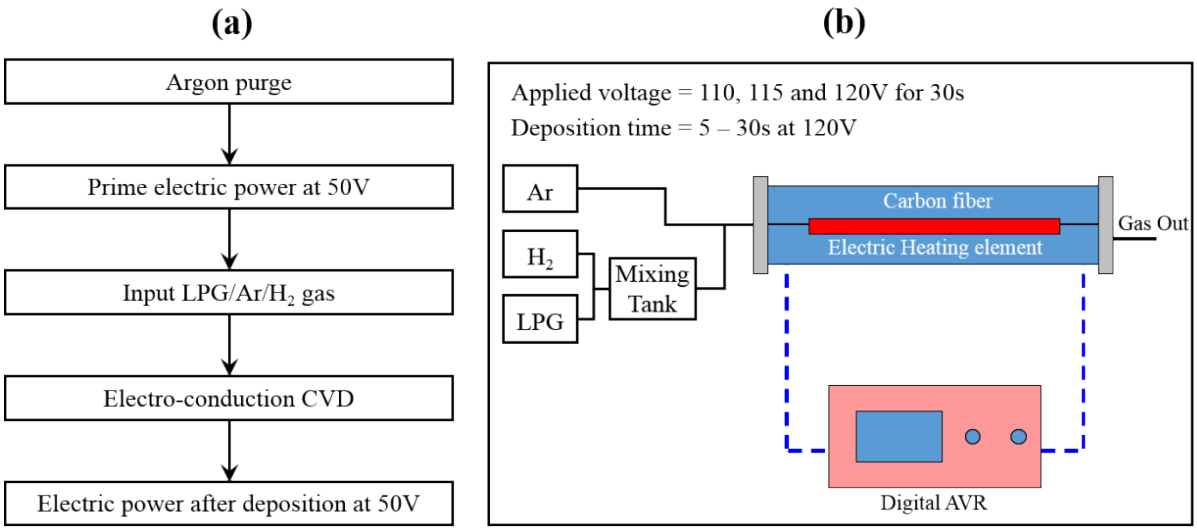

Figure S1. (a) Experimental procedure and (b) schematic illustration of electro-conductive chemical vapor deposition.

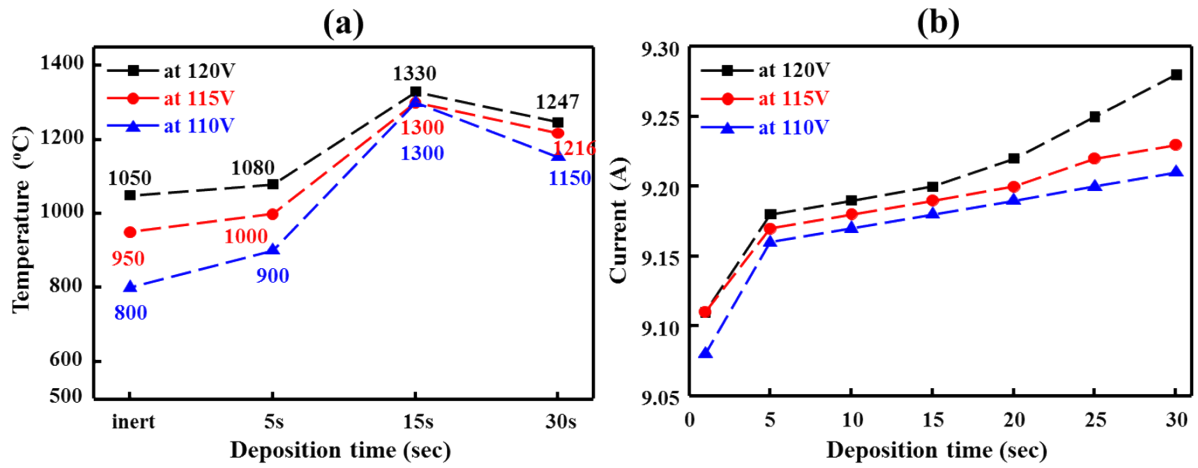

Figure S2 The variation of (a) temperature and (b) current during electro-conductive CVD as a function of deposited time.

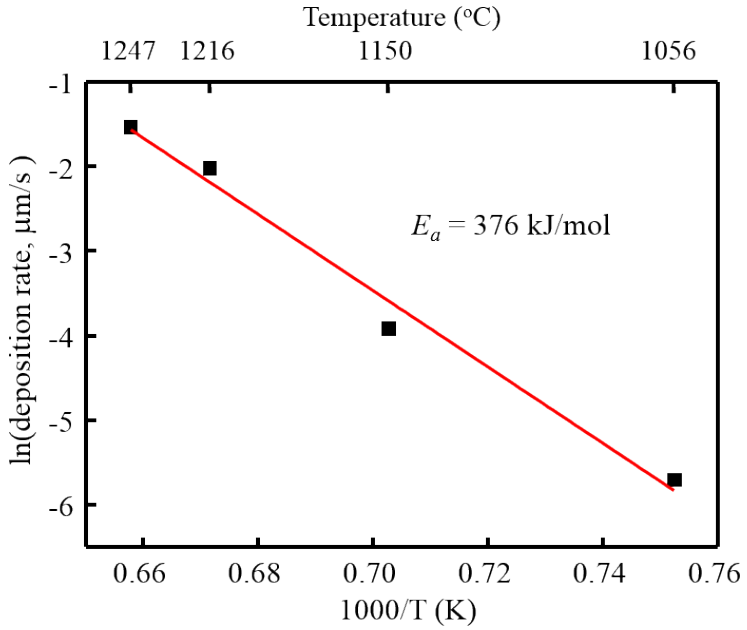

Figure S3 Arrhenius plot of deposition rate on the surface of carbon fibers.

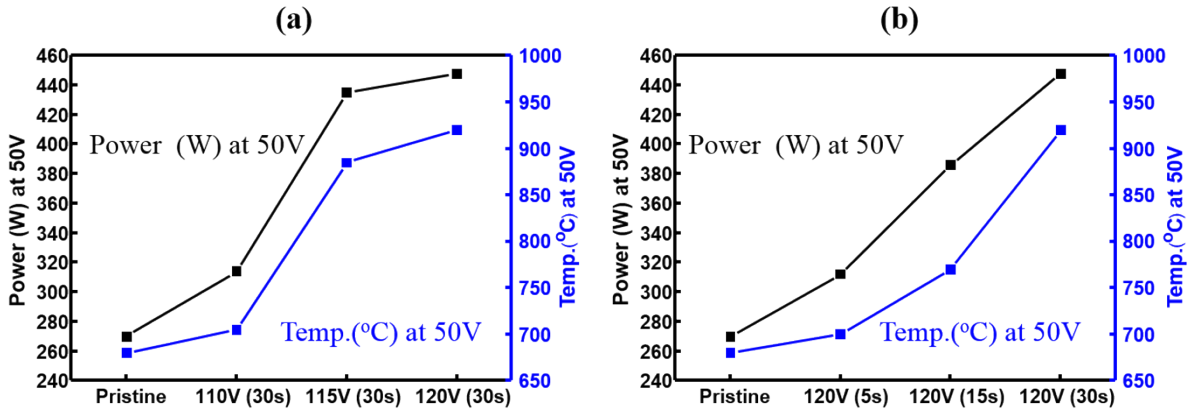

Figure S4 Variations of power and temperature (at 50V) after electro-conductive CVD (a) as a function of applied voltage (where reaction time is fixed for 30s), and (b) as a function of deposition time (where applied voltage is fixed at 120 V)

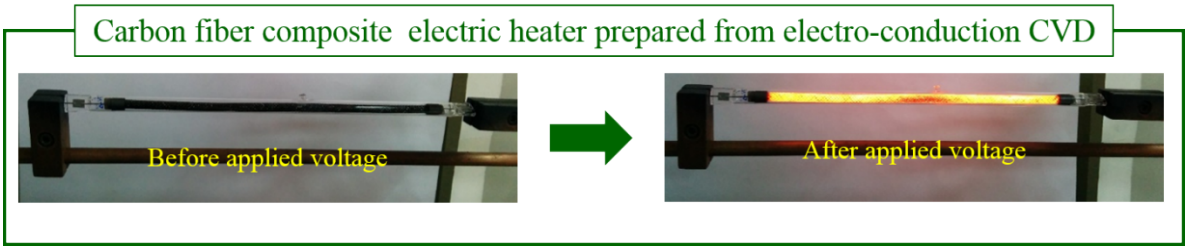

Figure S5 Photos showing assembled carbon fiber composite electric heater using electro-conductive chemical vapor deposition before (a) and after applied voltage (b)