

The supporting information of

Chemical Assembling of Amine Functionalized Boron Nitride Nanotubes onto Polymeric Nanofiber Film for Improving their Thermal Conductivity

Dukeun Kim,^a Sumin Ha,^b Hoi Kil Choi,^d Jaesang Yu,^d and Yoong Ahm Kim^{b,c,*}

^aSMART Textile Material R&D Team, Korea High Tech Textile Research Institute, 170, Geomjun-gil, Nam-myeon, Yangju-si, Gyeonggi-do, 11410, Korea

^bAlan G. MacDiarmid Energy Research Institute, School of Polymer Science and Engineering & Department of Polymer Engineering, Graduate School, Chonnam National University, 77 Yongbong-ro, Buk-gu, Gwangju 61186, Republic of Korea

^cInstitute for Biomedical Sciences, Interdisciplinary Cluster for Cutting Edge Research, Shinshu University, 3-1-1 Asahi, Matsumoto, Nagano, Japan

^dMutifunctional Structural Composites Research Centre, Institute of Advanced Composite Materials, Korea Institute of Science and Technology (KIST), 92, Chudong-ro, Bongdong-eup, Wanju-gun, Jeonbuk, 55324, Republic of Korea.

*Corresponding authors.

Tel: +82-62-530-1871, Fax: +82-62-530-1920, E-mail: yak@jnu.ac.kr; Tel: +82-63-219-8156, Fax: +82-63-219-8239, E-mail: jamesyu@kist.re.kr

Experimental Process

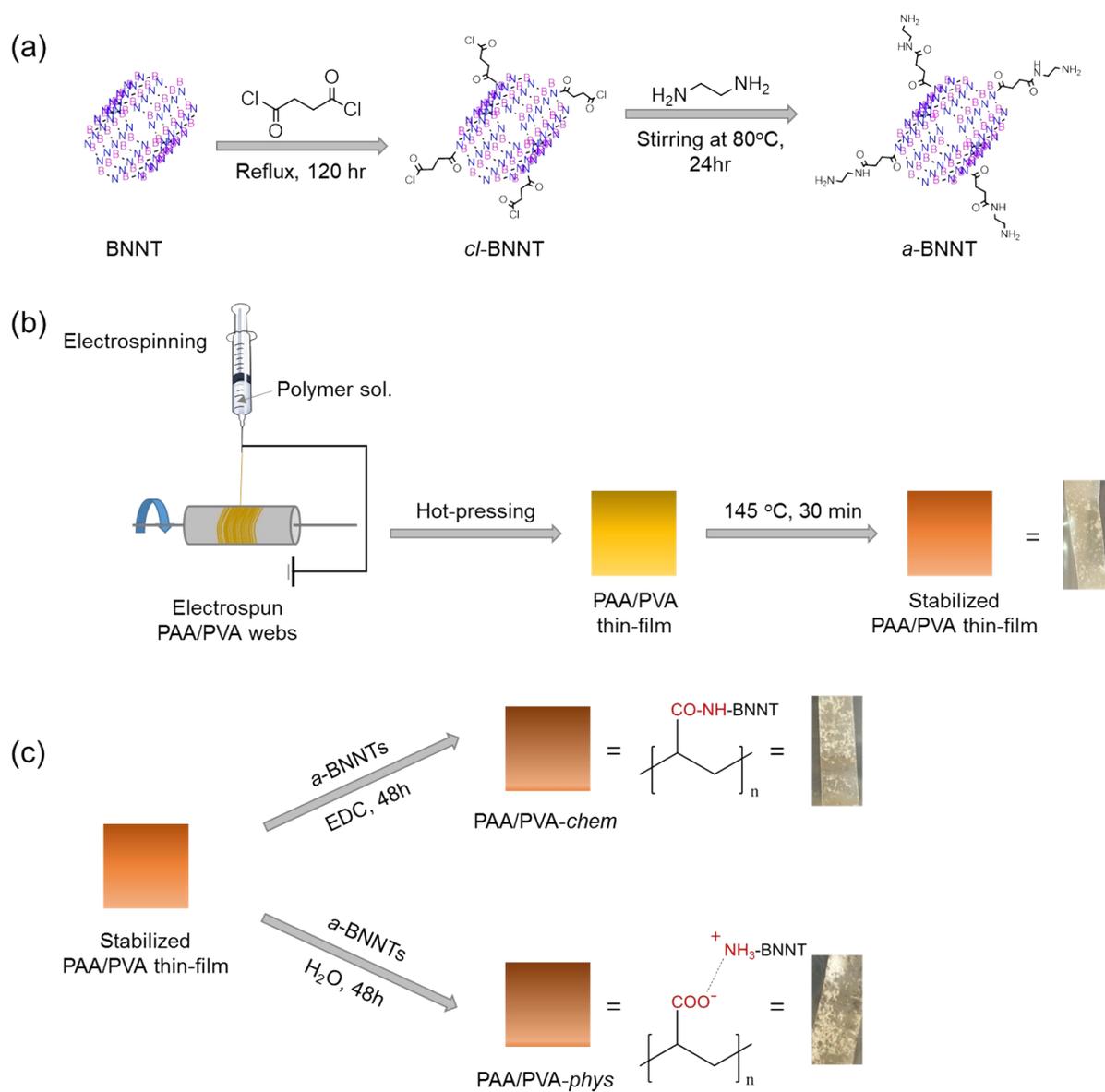


Figure S1. Schematic preparation process of (a) the amine functionalization of BNNTs, (b) PAA/PVA nanofibrous thin films, and (c) the physical and chemical assembly of functionalized BNNTs onto PAA/PVA nanofibrous thin films.

Evidence of *a*-BNNTs synthesis

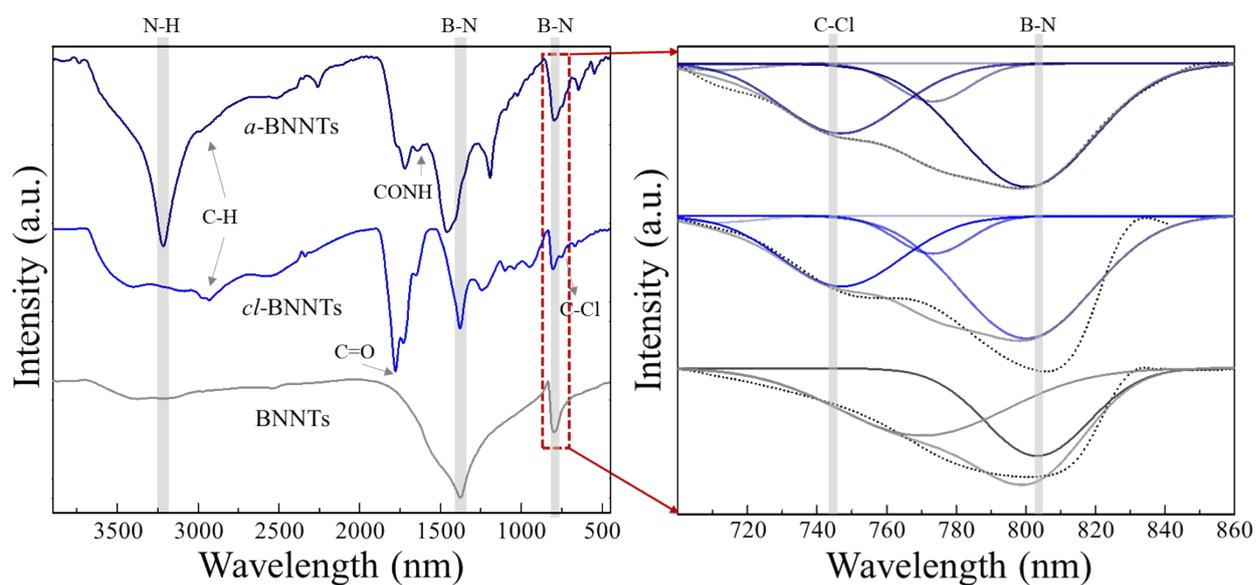


Figure S2. FT-IR of the pristine, chlorinated and amine functionalized BNNTs and the bending vibration portion between 700 nm and 760 nm, which is related with B-N and C-Cl bond, is enlarged and deconvoluted.

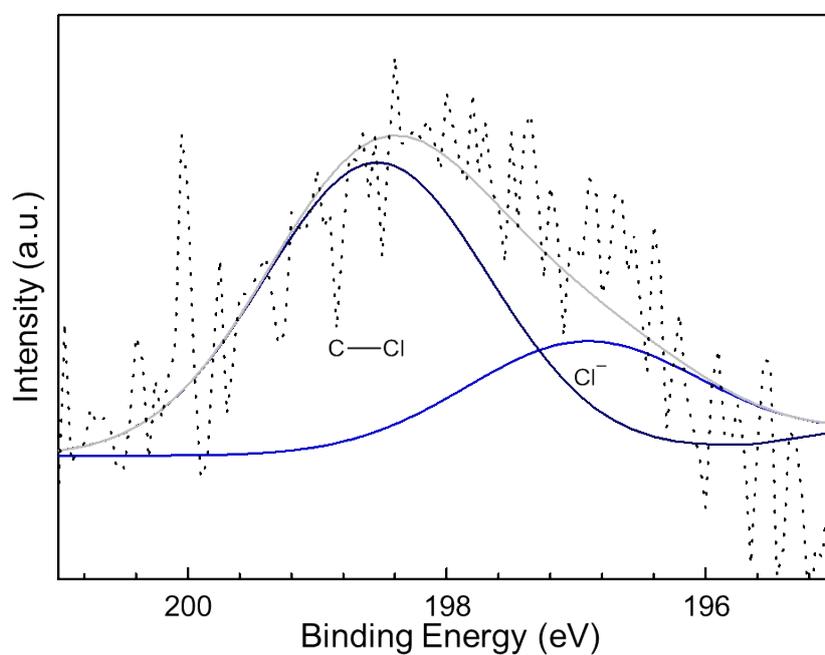


Figure S3. XPS Cl 2p spectra of the chlorinated and amine functionalized BNNTs.

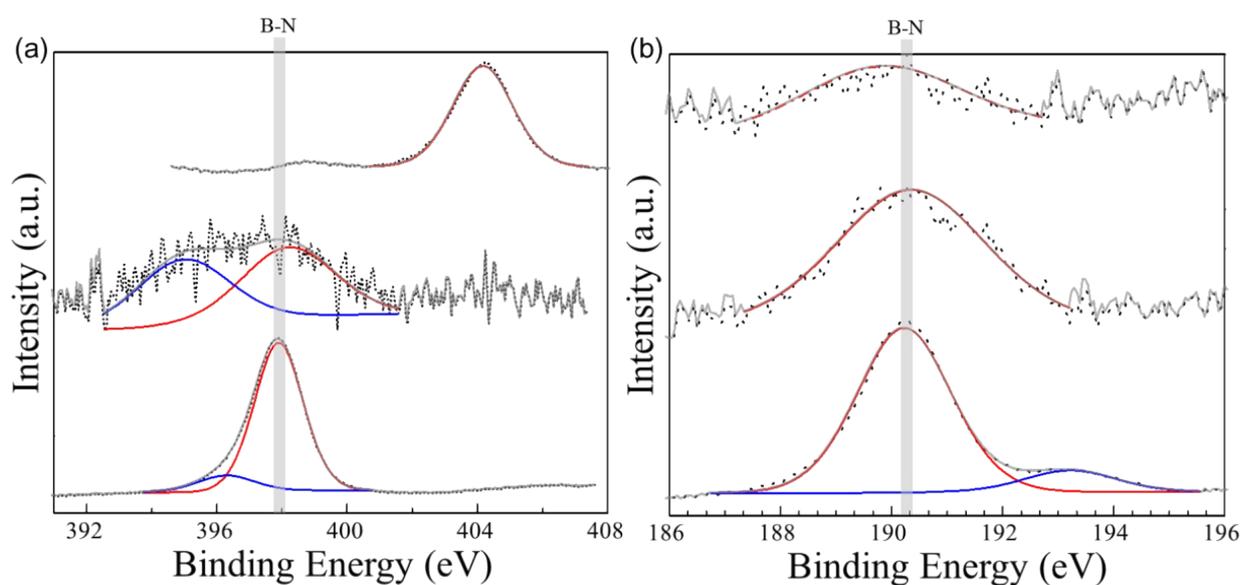


Figure S4. XPS N 1s and B 1s spectra of the pristine, chlorinated and amine functionalized BNNTs

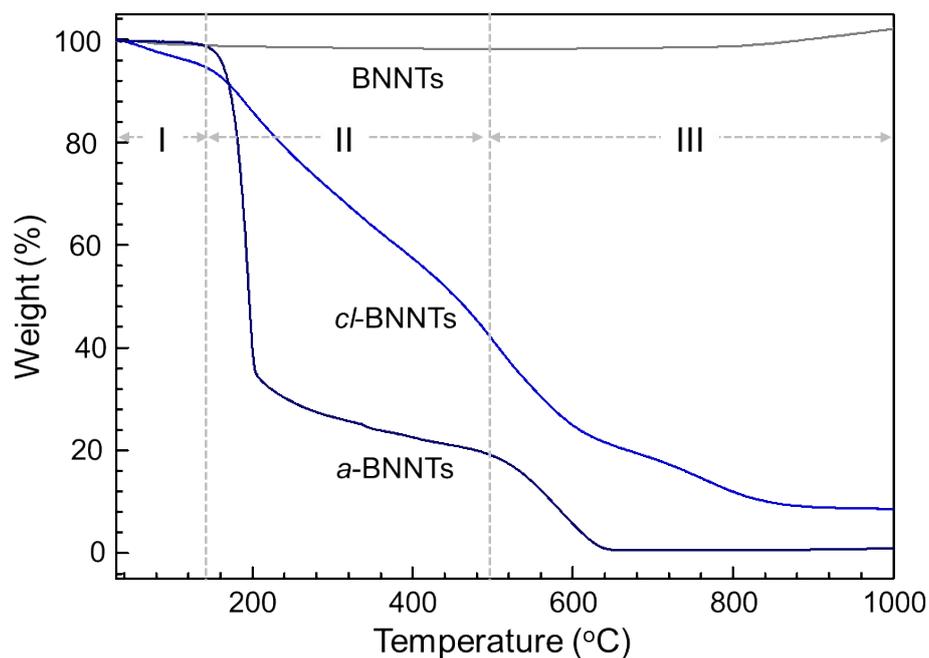


Figure S5. Thermogravimetric curves of the pristine, chlorinated and amine BNNTs.

The assembling of functionalized BNNTs onto PAA/PVA nanofibrous film

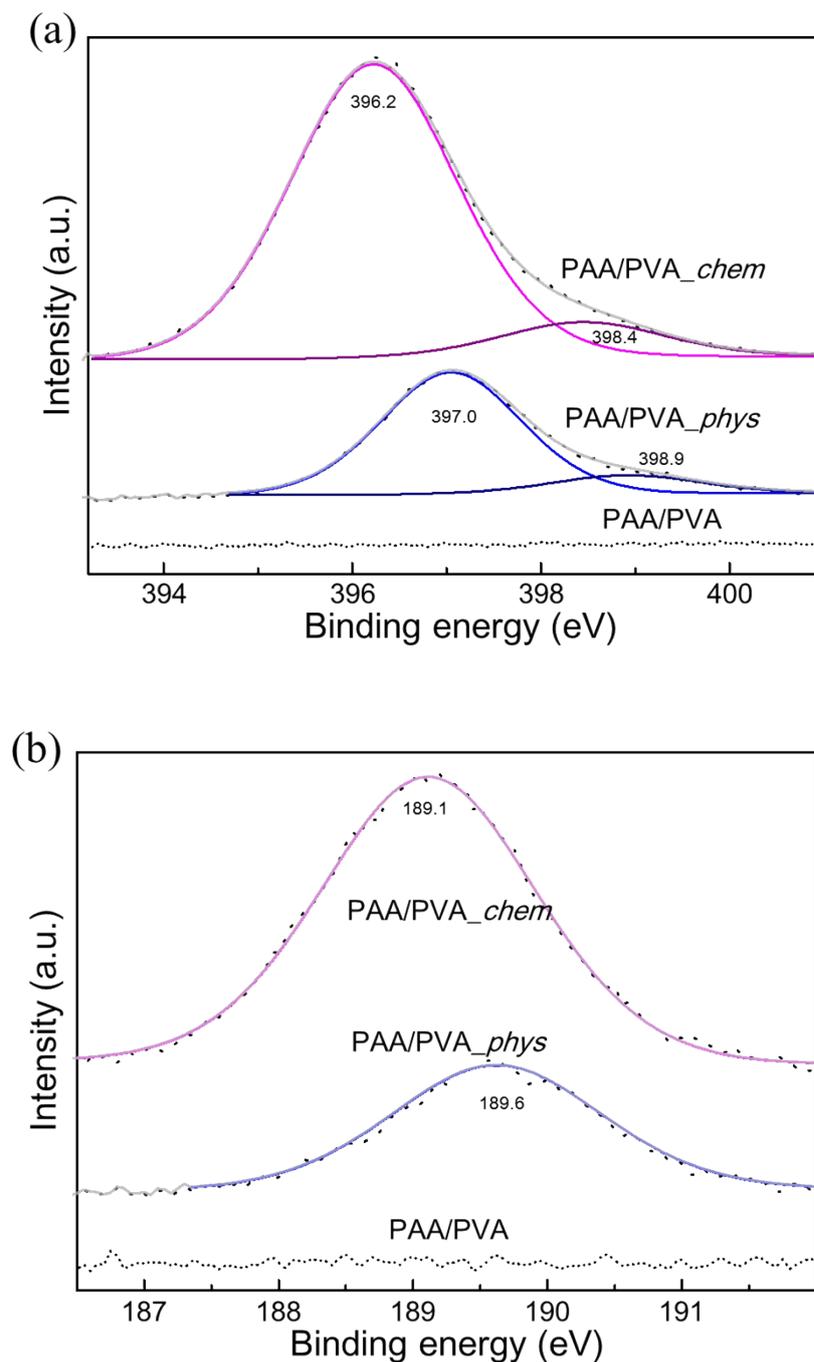


Figure S6. XPS (a) N1s and (b) B 1s spectra of the pristine PAA/PVA nanofibrous thin film and the physically and chemically assembled nanofibrous thin films with functionalized BNNTs.

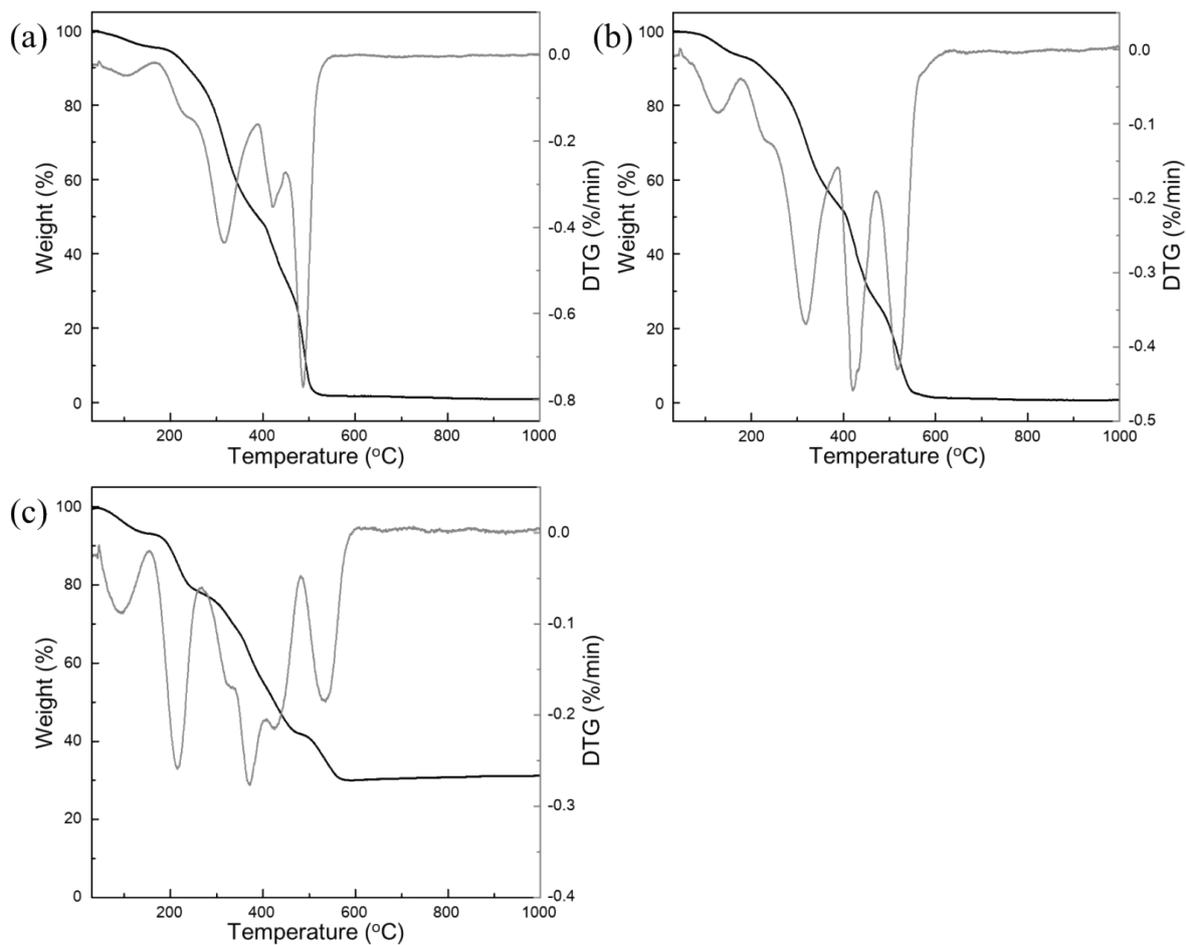


Figure S7. TG and DTG graphs for (a) PAA/PVA, (b) PAA/PVA-phys, and (c) PAA/PVA-chem

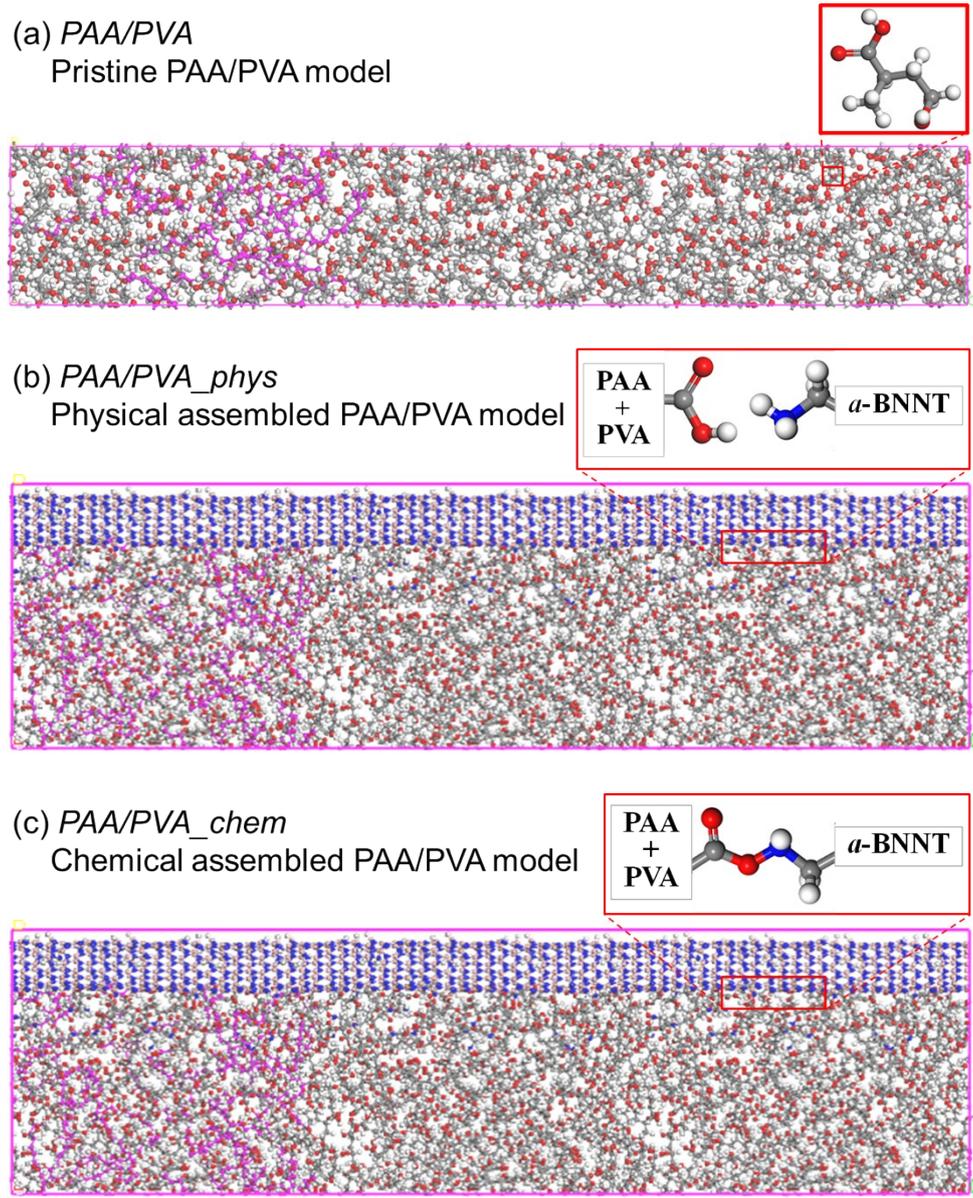


Figure S8. MD models for (a) pristine PAA/PVA nanofibrous thin film, (b) physical assembled and (c) chemical assembled PAA/PVA films with functionalized BNNTs