

# SUPPLEMENTARY MATERIAL

## **Hybrid Structure of a ZnO Nanowire Array on a PVDF Nanofiber Membrane/Nylon Mesh for use in Smart Filters: Photoconductive PM Filters**

Dong Hee Kang, Na Kyong Kim and Hyun Wook Kang\*

*Department of Mechanical Engineering, Chonnam National University*

*77 Youngbong-ro, Buk-Gu, Gwangju 61186, Republic of Korea*

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\*Corresponding author: Prof. Hyun Wook Kang

Tel: +82-62-530-1662

Fax: +82-62-560-1689

E-mail: kanghw@chonnam.ac.kr

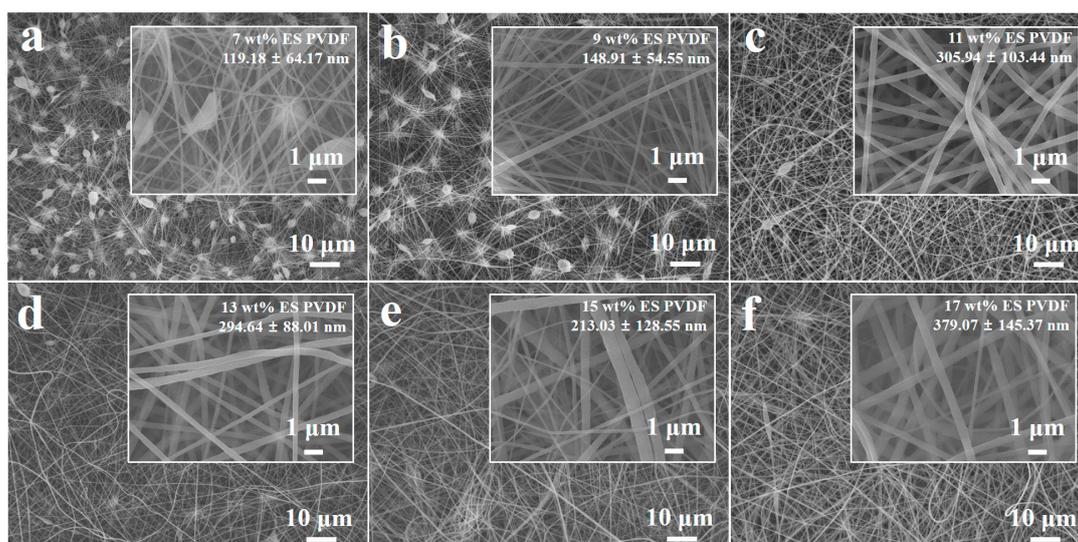
## **Supplementary Material**

**Figure S1.** The SEM images of the PVDF nanofiber membrane depending on the PVDF concentration.

**Figure S2.** Pressure difference of the PVDF nanofiber membrane depending on the PVDF concentration.

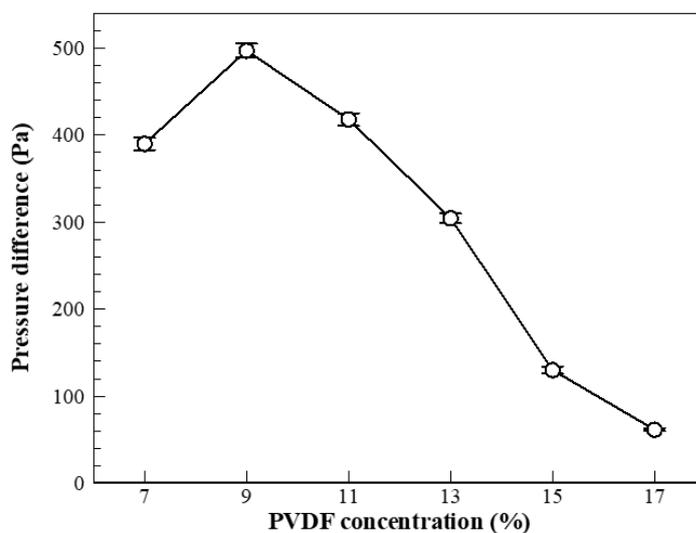
## Supplementary Material

The uniformity and diameter of the PVDF nanofiber is controlled by changing the concentration of the polymer solution. The viscosity of the 7 and 17 wt% PVDF solutions show the lower and the upper limit respectively, to fabricate nanofiber at the electrospinning. In the case of the concentration of 7 wt% PVDF solution condition, nanofiber geometry shows 120 nm average diameter, however, there are 67 beads over 2  $\mu\text{m}$  size per 0.01  $\text{mm}^2$  area. In contrast, concentration of 17 wt% PVDF solution condition, bead formation is not occurred due to stabilization of the polymer jet during the electrospinning. High viscosity in the polymer jet increases the nanofiber diameter to 380 nm.



**Figure S1.** The SEM images of the PVDF nanofiber membrane depending on the PVDF concentration.

In the electrospinning preparation step, PVDF solution concentration is controlled to 7, 9, 11, 13, 15, and 17 wt% in the acetone:DMF (7:3) mixture. The weight of nanofiber membrane is constantly controlled by changing the fabrication time based on the weight percent of the solute in the solution. The Figure S2 shows the pressure drop of the PVDF nanofiber membrane depending on the polymer concentrations.



**Figure S2.** Pressure difference of the PVDF nanofiber membrane depending on the PVDF concentration.