

## **Supplementary information**

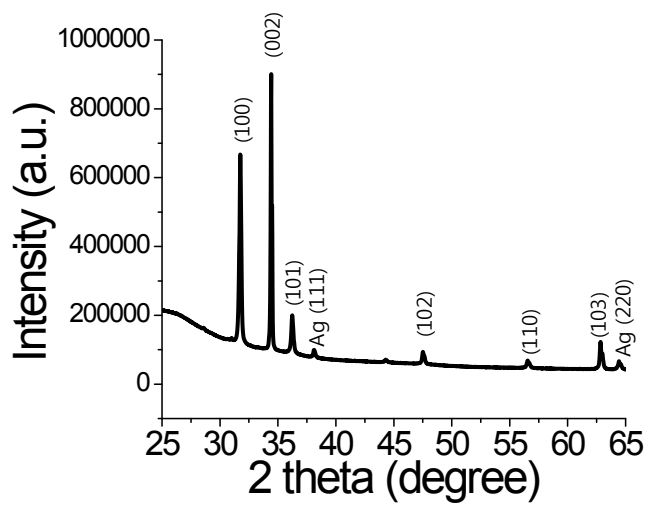
### **Flexible ultraviolet photodetectors with ZnO nanowire networks fabricated by large area controlled roll-to-roll processing**

Janghoon Park<sup>a</sup>, Jongsu Lee<sup>a</sup>, Youngwook Noh<sup>a</sup>, Kee-Hyun Shin<sup>b,c</sup>, and Dongjin Lee<sup>\*b,c</sup>

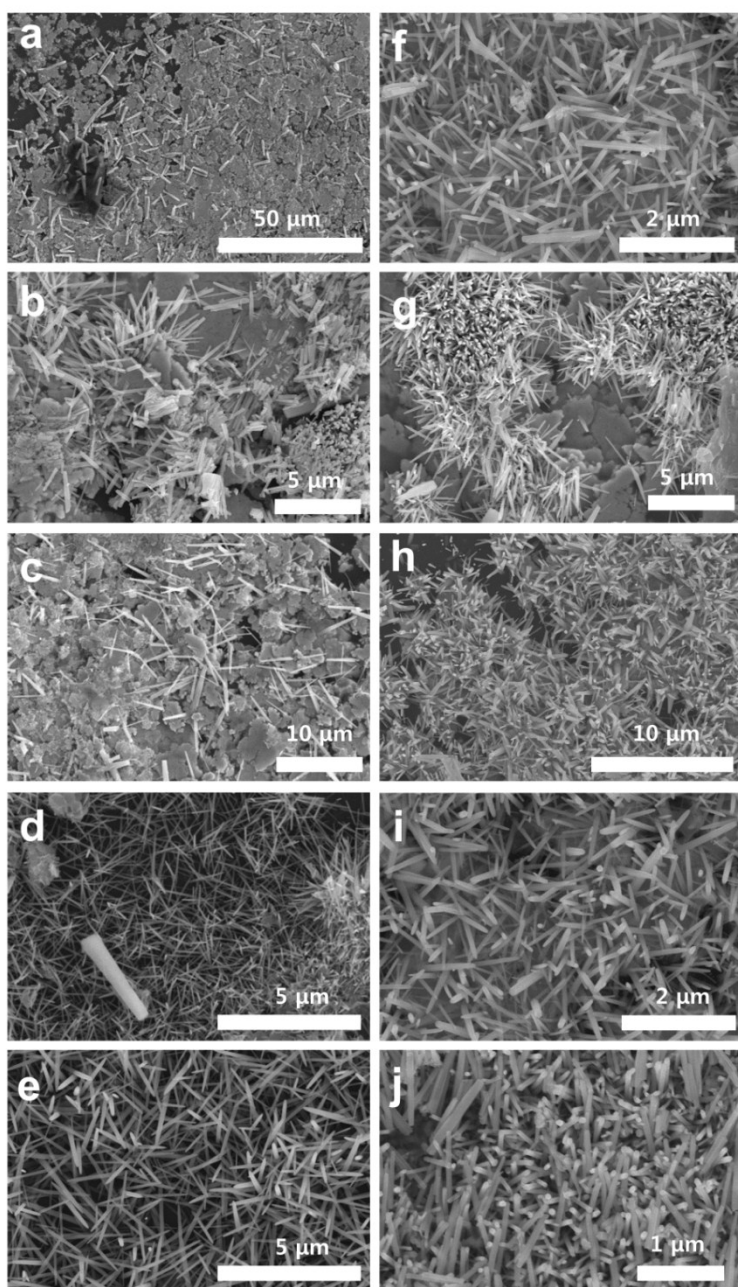
<sup>a</sup>Department of Mechanical Design and Production Engineering, <sup>b</sup>School of Mechanical Engineering and <sup>c</sup>Flexible Display Roll-to-Roll Research Center, 120 Neungdong-ro, Gwangjin-gu, Seoul 143–701, Korea

#### **Corresponding author**

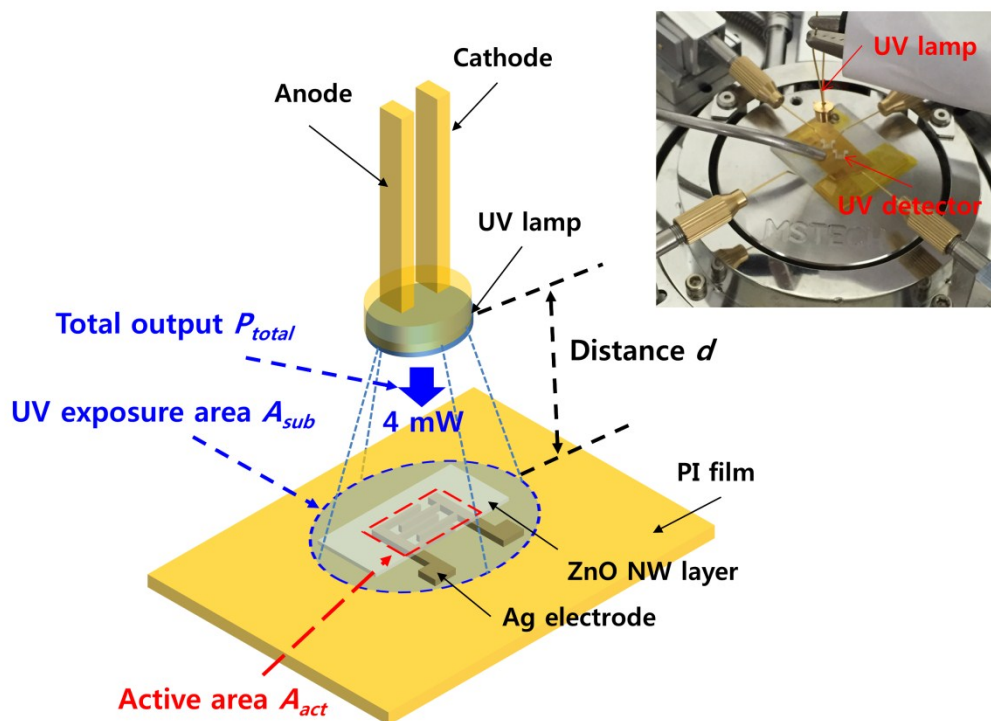
\*E-mail: [djlee@konkuk.ac.kr](mailto:djlee@konkuk.ac.kr)



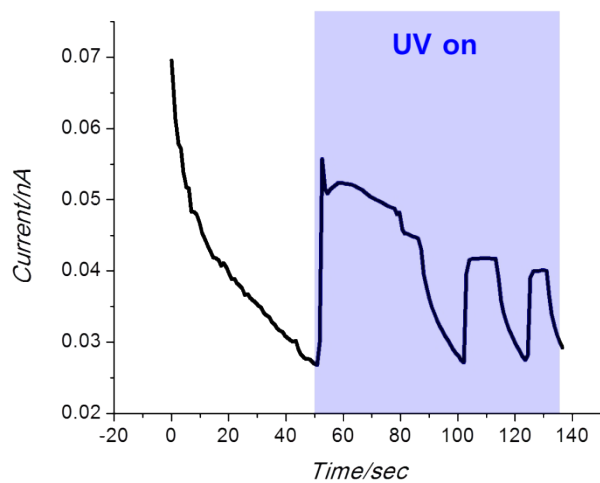
**Fig. S1.** XRD peaks of the ZnO NWs and Ag patterns on a PI substrate.



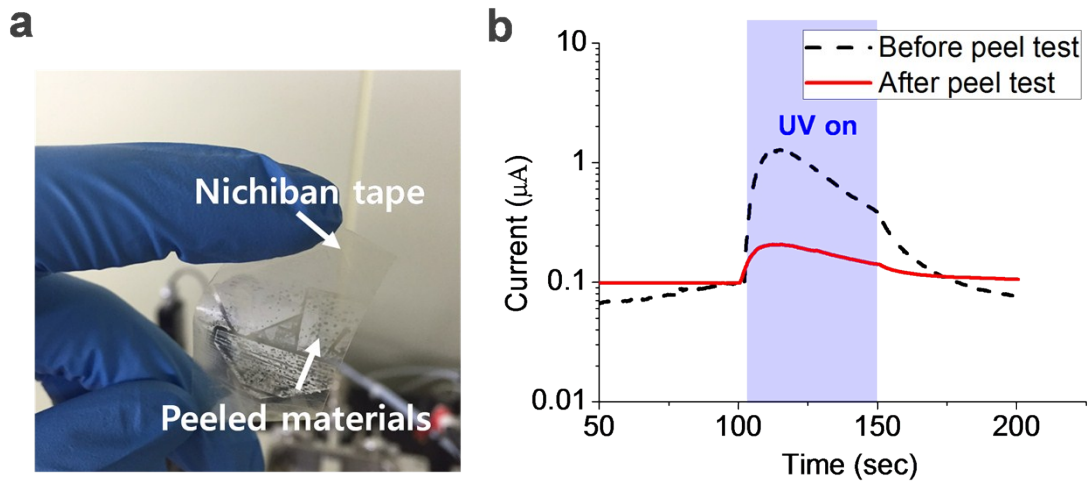
**Figure S2.** SEM images of the ZnO NW networks produced at various seeding conditions. The corresponding seed layer thicknesses and NW diameters were (a) 12.3 nm and 917.6 nm, (b) 21.9 nm and 216.8 nm, (c) 22.3 nm and 122.35 nm, (d) 27.7 nm and 70.9 nm, (e) 28.6 nm and 137.5 nm, (f) 34.5 nm and 137.7 nm, (g) 35 nm and 276.3 nm, (h) 40 nm and 92.2 nm, (i) 49.7 nm and 70.5 nm, and (j) 62.5 nm and 67 nm, respectively.



**Figure S3.** A UV photodetection setup containing the UV photodetector and the UV lamp, which was installed at a certain distance from the detection area. The inset depicts an actual photograph of the setup.



**Figure S4.** A photocurrent produced by the UV photodetector with a ZnO seed layer. The applied bias voltage was 10 V, and the UV light energy density was equal to  $127 \mu\text{W}/\text{cm}^2$  (at 3.3 V). Despite the UV irradiation, the photocurrent magnitude repeatedly fluctuated, indicating that the depleted ZnO surface was not acting as a sensing layer.



**Fig. S5.** Standard peel-off test for the fabricated flexible ZnO UV photodetector. (a)

Photograph of a taping test and (b) the saturation responses of the UV photodetectors at a bias voltage of 1 V and a UV light energy density of  $127 \mu\text{W}/\text{cm}^2$  for comparison before and after the peel test.