

Characteristics of flexible ZnO nanorod UV photodetectors processed by using a direct silicon etching transfer method

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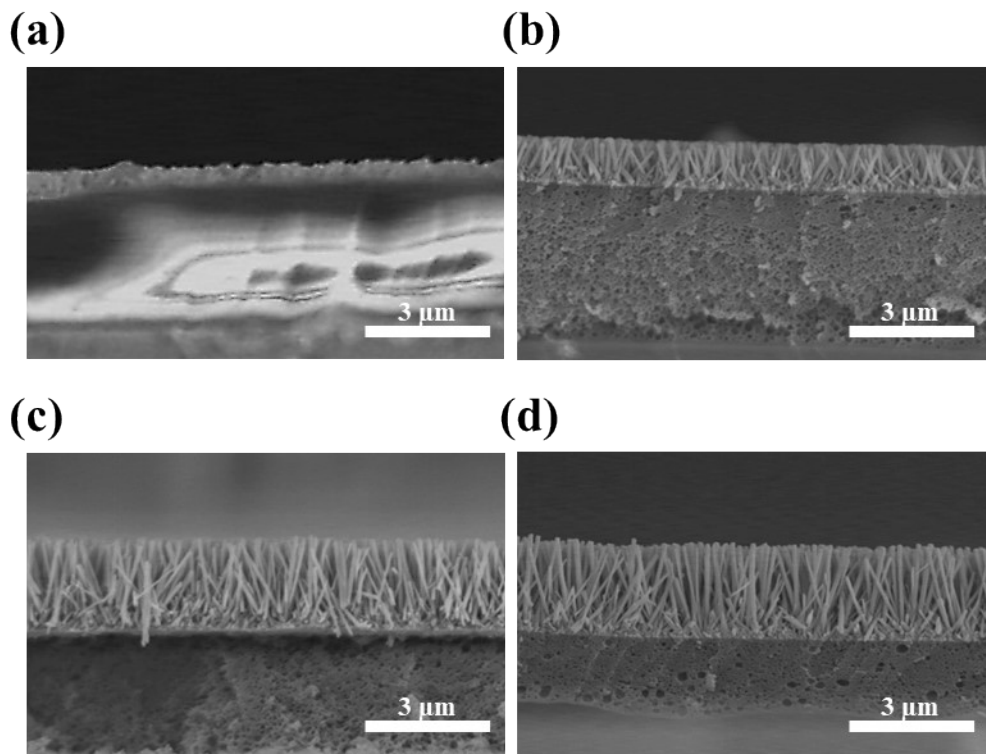


Fig. S1. Scanning electron microscopy (SEM) images of the ZnO nanorods (NRs) grown for different times: (a) 30, (b) 60, (c) 90, and (d) 120 min.

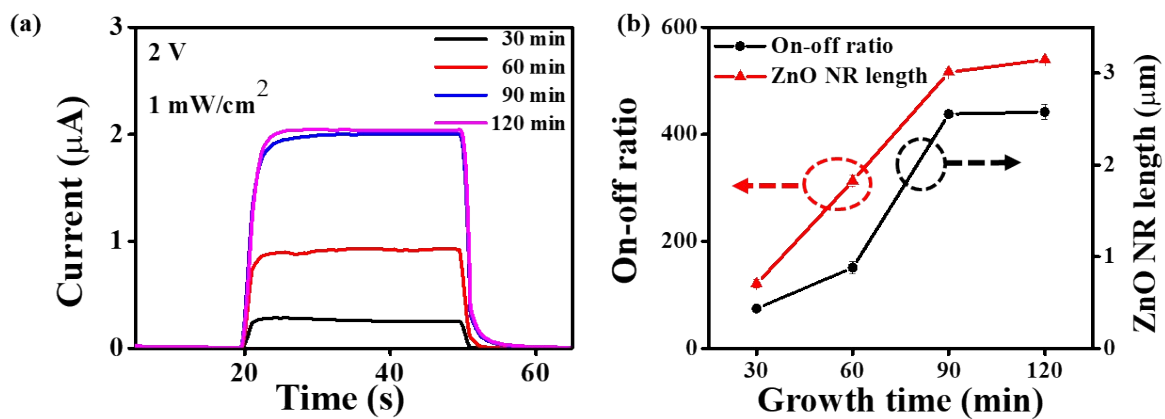


Fig. S2. Variation in the UV-sensing properties of the ZnO nanorod (NR) photodetector on a Si substrate with a change in the growth time of the ZnO NRs: (a) UV photoresponse after different growth times and (b) length of the ZnO NRs and on-off ratio with respect to the growth time.

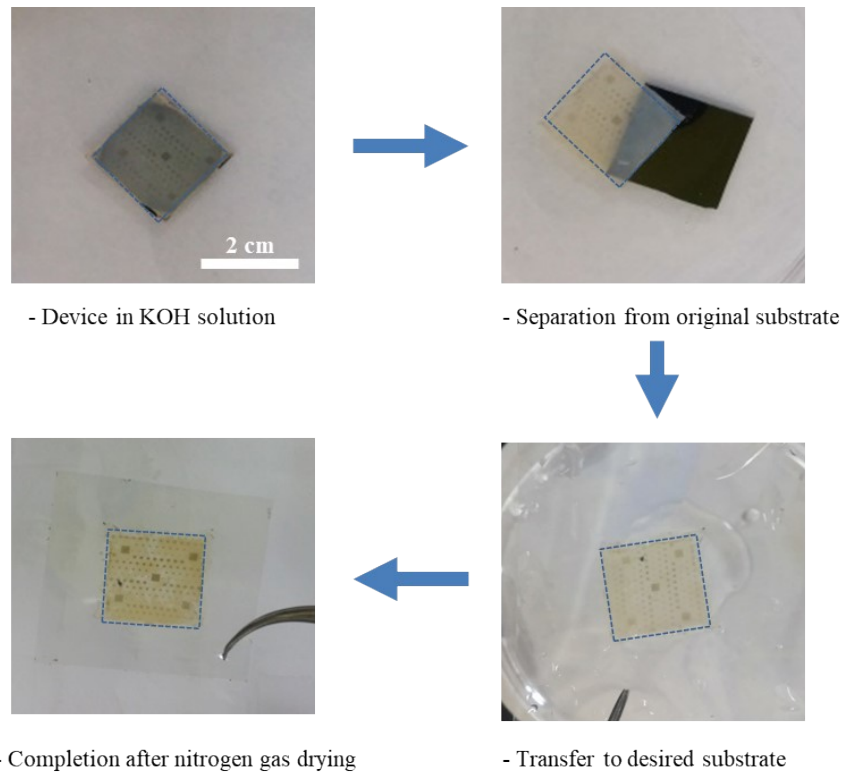


Fig. S3. Photographs of the ZnO NR photodetectors captured during the direct silicon etching transfer (DSET) process.

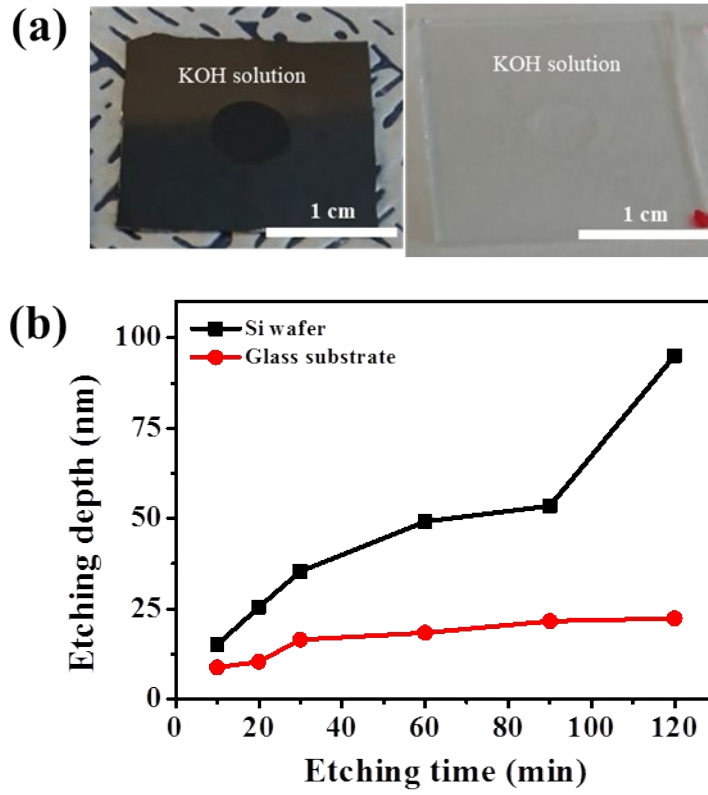


Fig. S4. (a) Photographs of a Si wafer and glass substrate in KOH solutions and (b) etching depths of the Si wafer and glass substrates as a function of the etching time in dilute KOH.

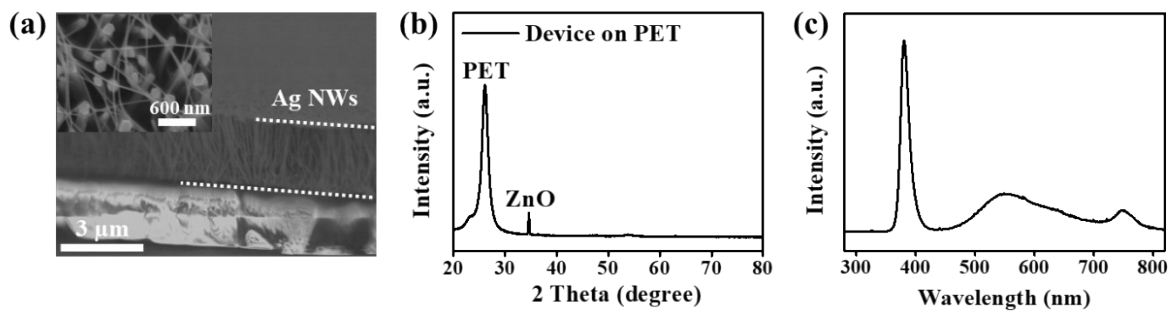


Fig. S5. (a) Side-view and top-view (inset) SEM images, (b) X-ray diffraction pattern, and (c) photoluminescence spectra of ZnO NRs transferred to a PET substrate by using the DSET process.

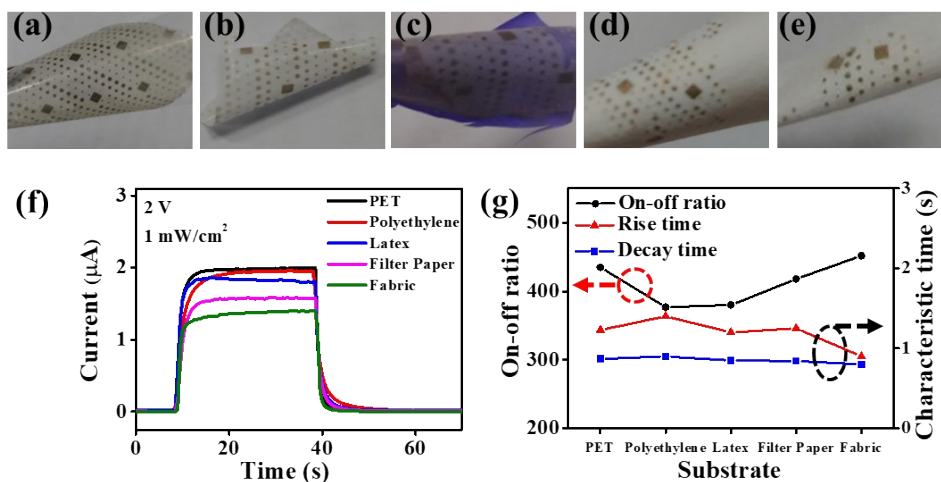


Fig. S6. Photographs of the ZnO NR photodetectors on various substrates after their transfer by using the DSET process: (a) PET, (b) polyethylene, (c) latex, (d) filter paper, and (e) fabric. (f) UV photoresponses and (g) on-off ratios, rise times, and fall times of the devices on various substrates.

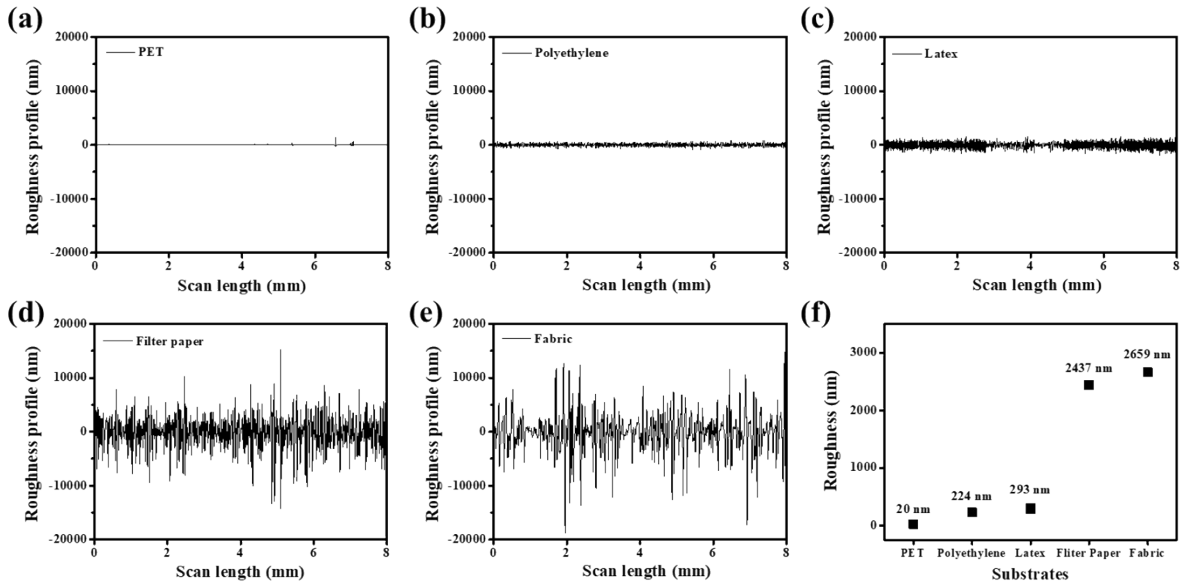


Fig. S7. Surface roughness profiles of the ZnO NR photodetectors on various substrates: (a) PET, (b) polyethylene, (c) latex, (d) filter paper, and (e) fabric. (f) Roughness values of various substrates.

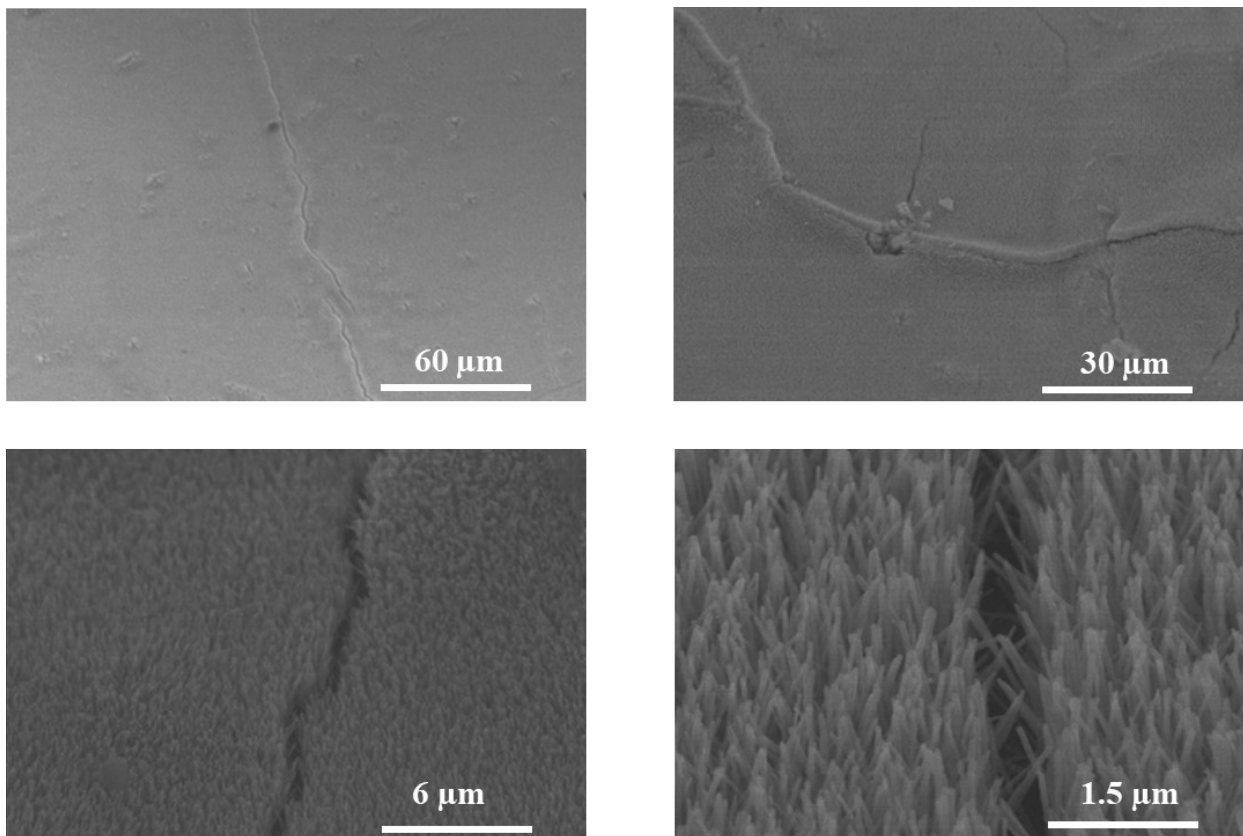


Fig. S8. SEM images of the flexible ZnO NR UV photodetector at different magnifications after the dynamic bending test at a bending radius of 1.0 mm.