

## Support information

### Figure S1

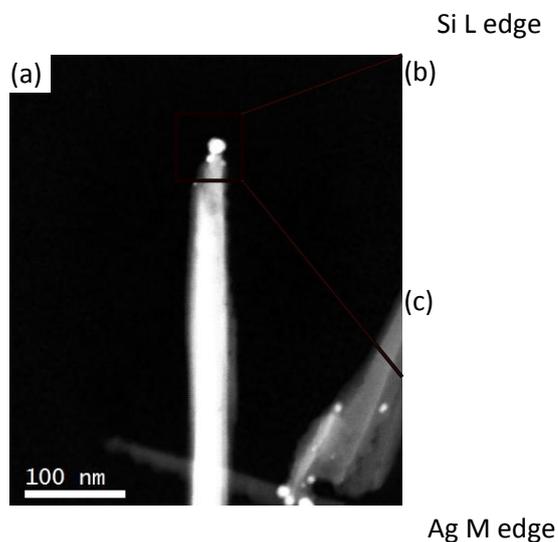


Figure S1. (a) STEM image of a Si nanowire fabricated using the MCEE method. The EELS mapping images based on (b) L edge of Si element and (c) M edge of Ag element. The EELS results clearly indicate that the particle on the top of the nanowires is silver.

**Table S1. The compositions of the Si and O calculated from the EELS spectra of the SiNWs in the various stages of the surface treatment process.**

Composition	As-grown	After ozone treatment	After HF etching
Si (at%)	85.32	39.9	65.6
O (at%)	14.68	63.1	34.4

Figure S2

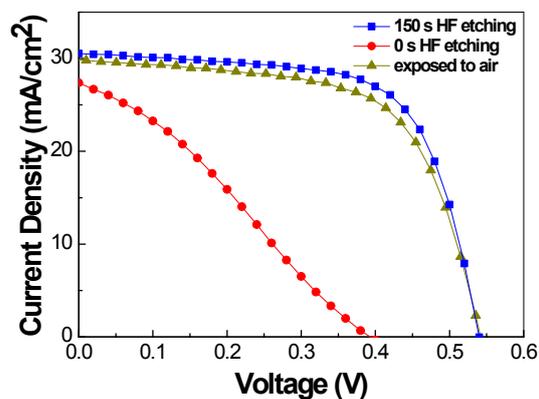


Figure S2. J-V characteristics of the hybrid cells based on the SiNW etched with HF solution for 0s and 150 s after ozone treatment, as well as SiNWs directly exposed to air for 1 day. The SiNW hybrid cell after 150 s HF etching shows PCE of 10.9% with a  $J_{sc}$  of 30.5 mA/cm<sup>2</sup> and  $V_{oc}$  of 0.54 V. Without the HF etching process, the  $V_{oc}$  (0.39 V) and the FF (29.5%) are degraded due to the larger  $R_s$ . The sample exposed to the air for 1 day reveals a  $V_{oc}$  of about 0.54 V.