

Supporting information

The role of few-layer TiO_x surfactant: remarkably-enhanced succeeding radial growth and properties of ZnO nanowires

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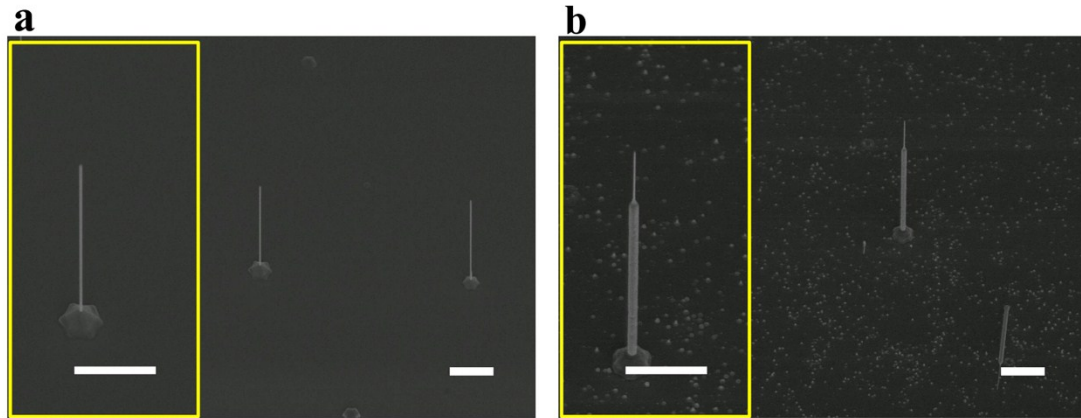


Fig. S1 (a) Typical SEM image taken from the homogeneous ZnO NWs serving as the cores. Inset: enlarged images for a single NW. (b) Typical SEM image of the re-grown NWs, whose re-growth time is about 11s, after TiOx coating with 5 cycle. Inset: enlarged images for a single NW. The scale bars are all 2 μm .

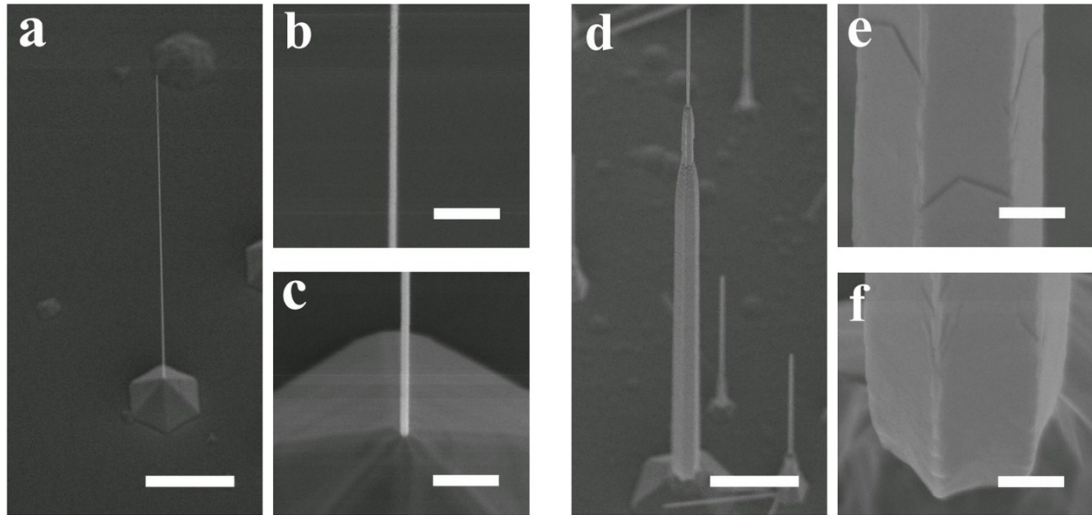


Fig. S2 The representative SEM images of the homogeneous NWs serving as the cores and NWs with micron-size diameter obtained by simply repeating the re-growth procedure once more. (a) The SEM image of the core NWs, the enlarged views near the middle and the bottom regions are shown in (b) and (c), respectively. (d) The corresponding SEM image of the NWs with micron-size diameter obtained by simply repeating the re-growth procedure once more, the enlarged views near the middle (core-2 shell) and the bottom (core-2 shell) regions are shown in (e) and (f), respectively. The scale bars in (a) and (d) are 5 μm , and the rest (b, c, e, and f) are all 500 nm.

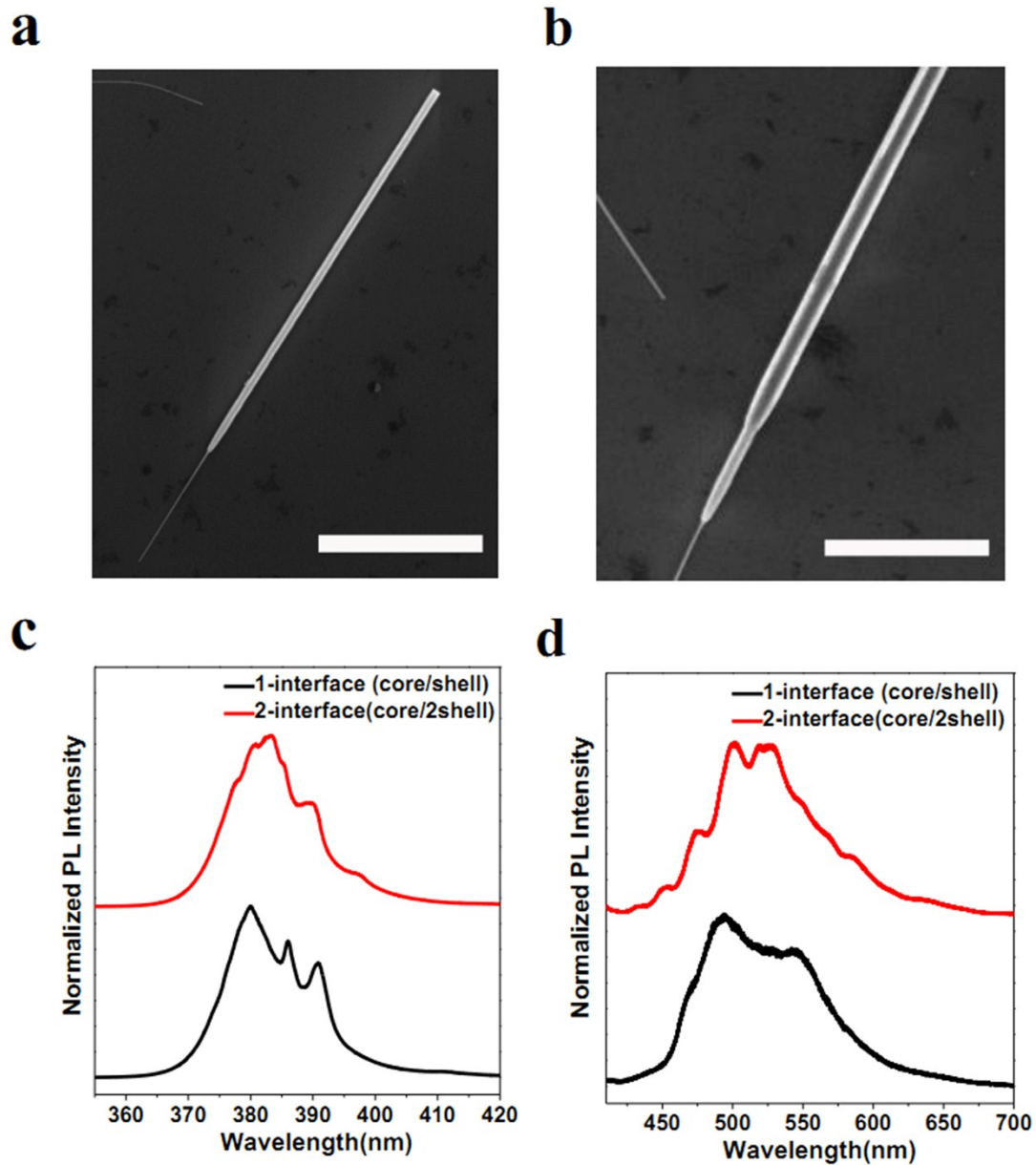


Fig. S3 Typical SEM images of re-grown NWs with the diameter of 550 nm (a) and NWs with the diameter of 1500 nm (b) obtained by repeating the re-growth procedure once more. Both of the samples were transferred from the substrates to the Si substrates with 300 nm thickness thermal SiO₂ film. (c ,d) RT PL spectra of the NBE and deep-level (DL) emissions collected from the NWs in (a) and (b). The sharp and rich optical fine structures observed in the band tails of the NBE and deep-

level (DL) emissions indicate the high optical quality and perfect geometry of the NW cavities for both samples. The scale bars in (a) and (b) are all 10 μm .

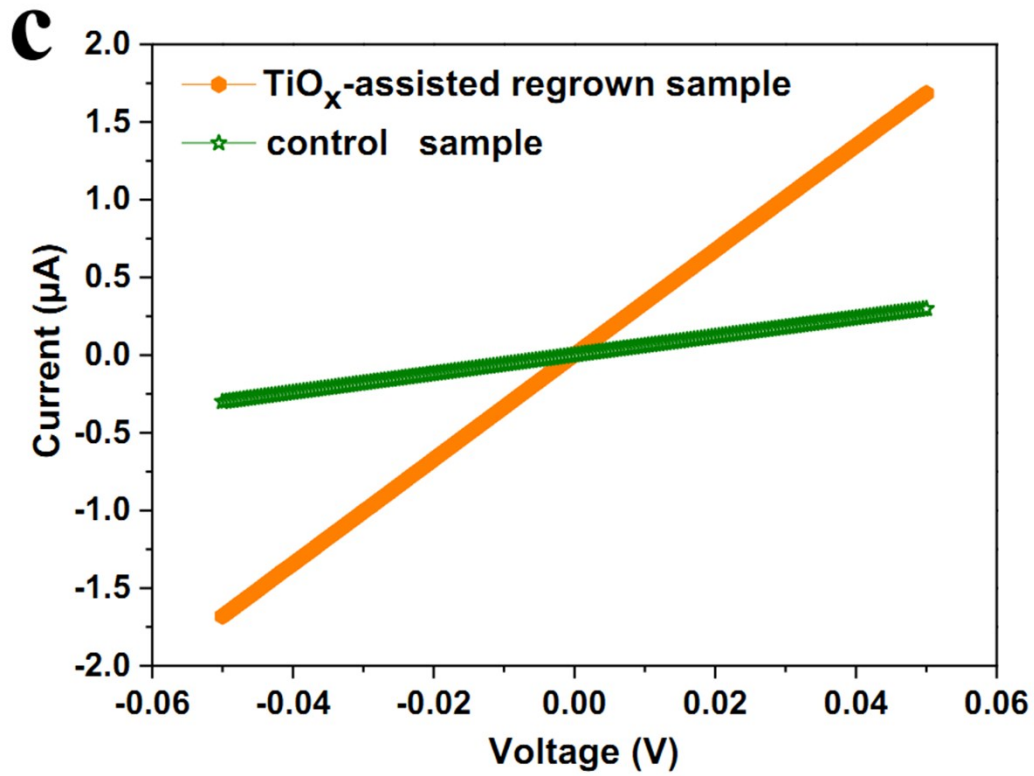
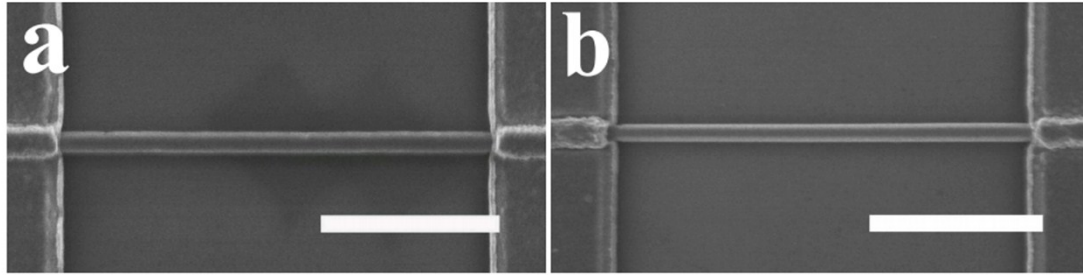


Fig. S4 The electrical properties of the TiO_x-assisted re-grown ZnO NWs comparing with the control one. (a, b) SEM images of the single NW-device made of the re-grown NW (a) and the control one (b), respectively. (c) Typical I-V curves of the individual re-grown NW (orange) at RT and the corresponding data for the control one (olive).