Supplementary information

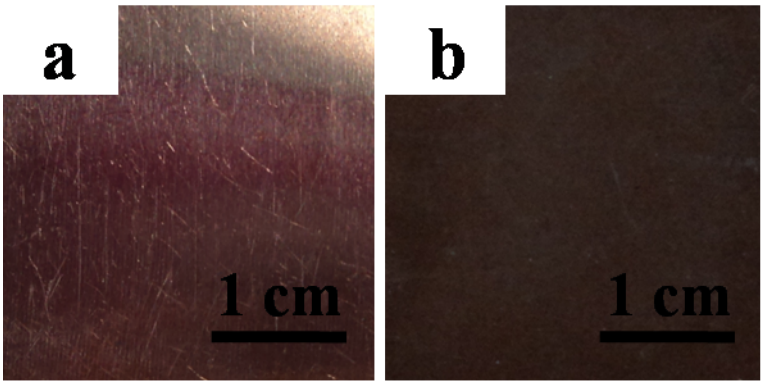

Fig. S1 Photographs of a copper foil (2.846 cm × 2.663 cm ×0.024 cm) before (a) and after (b) ZnO growth at 35 ^{o}C for 12 h, respectively.

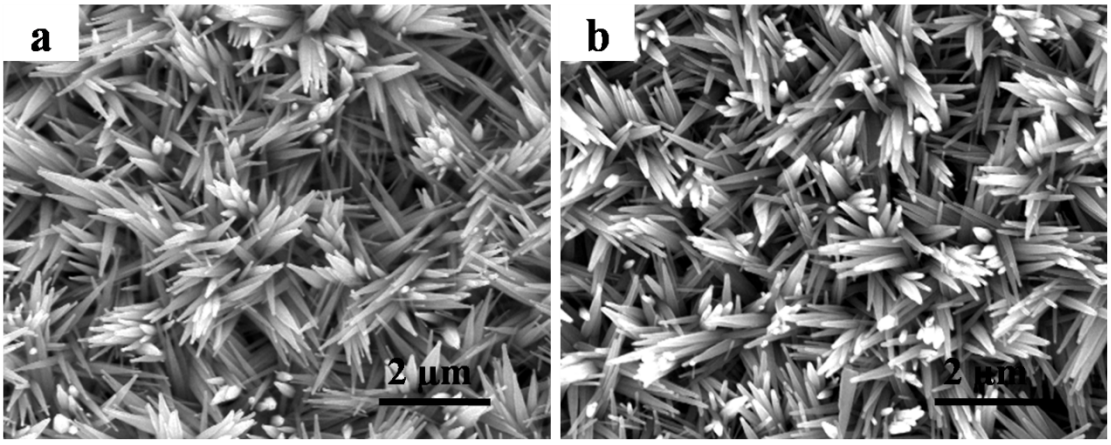

Fig. S2 SEM images of the ZnO nanocone arrays on the downward surface of copper foil at 30 ^{o}C for 12 h before (a) and after (b) sonication in water for 5 min, respectively.

The strength of the product-substrate interface was qualitatively probed by subjecting the sample to sonication in water for 5 min. It was found that the as-grown product on the downward surface was nearly unaltered (Fig. S2), but the as-grown product on the upward surface was almost completely removed. The results show that the interface strength between as-grown product and the downward surface may be stronger than that between as-synthesized product and the upward surface. In other words, when the object surface of substrate faces down, the yielding ZnO nanocone arrays possess with a strong interfacial connection.

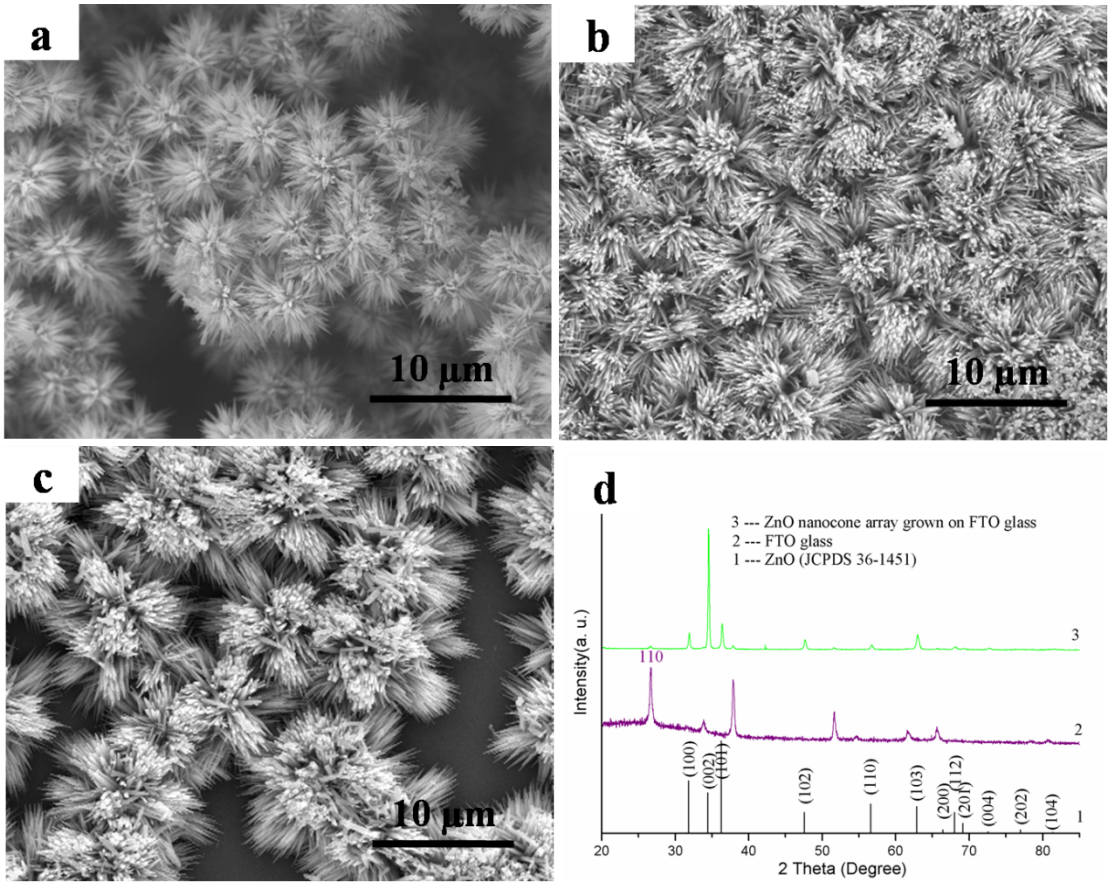

Fig. S3 (a, b and c) SEM images of ZnO nanocone arrays grown on the upward surface of FTO glass (a), the downward surface of FTO glass (b) and the downward surface of glass slide (c) at 35 ^{o}C for 12h, respectively. The Fig. S3d is the XRD pattern of the ZnO nanocone arrays grown on the downward surface of FTO glass substrate.

As for the FTO glass substrate, the similar result is found. The FTO glass substrate and ZnO crystals have a relatively low lattice mismatch ($(0001)[1\bar{1}20]_{ZnO}$ // $(110)[001]_{SnO_2}$ lattice mismatch 1.6%; perpendicular direction: $(0001)[\bar{1}100]_{ZnO}$ // $(110)[1\bar{1}0]_{SnO_2}$ lattice mismatch 19.3%), whereas, the lattice mismatch of the copper substrate and $Zn(OH)_2$ crystals is very high beyond 25% ($(011)[100]_{Zn(OH)_2}$ // $(110)[001]_{SnO_2}$ lattice mismatch 34.8%; perpendicular direction: $(011)[0\bar{1}1]_{Zn(OH)_2}$ // $(110)[1\bar{1}0]_{SnO_2}$ lattice mismatch 32.2%). Thus, ZnO nanostructure can preferentially be epitaxially grown on FTO glass substrate.