Electronic Supplementary Material (ESI) for Nanoscale

Supplementary Information

Substrate-induced effects on the optical properties of individual ZnO nanorods with different diameters

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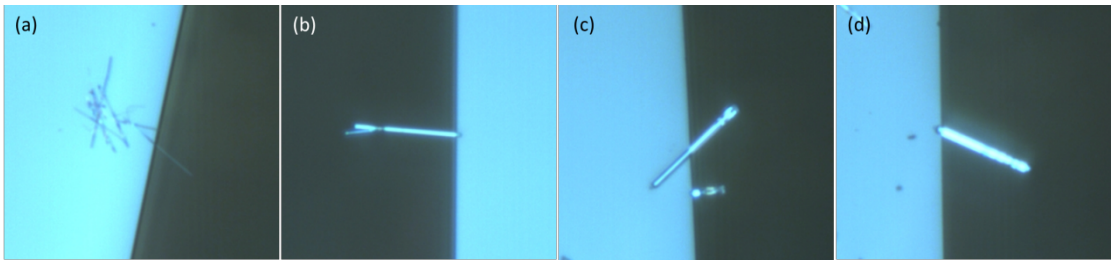

Fig. S1 (a)~(d) Optical images (X40 UV optical lens) of the suspended ZnO NRs with diameters of about 86 nm, 750 nm, 1.9 μm and 2.35 μm, respectively. The corresponding SEM images are shown in Fig. 1(d)~(g).

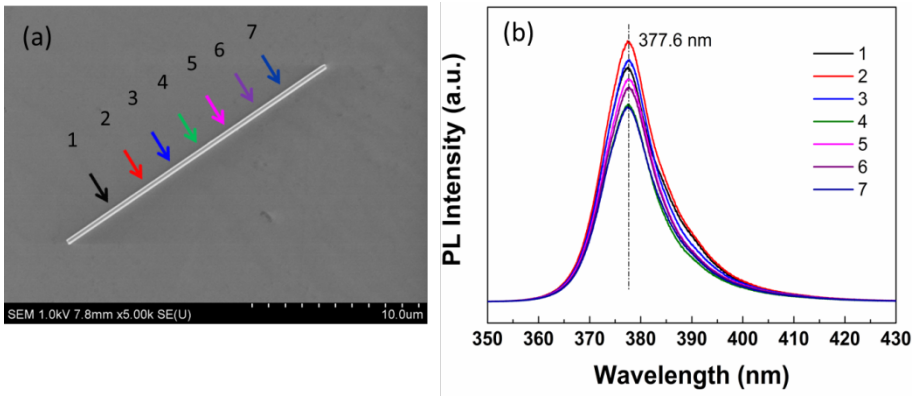

Fig. S2 (a) SEM image of a ZnO NR lying totally on the substrate; colored arrows indicate the PL measurement positions. The diameter of this NR is about 350 nm. (b) The corresponding position-dependent PL spectra.

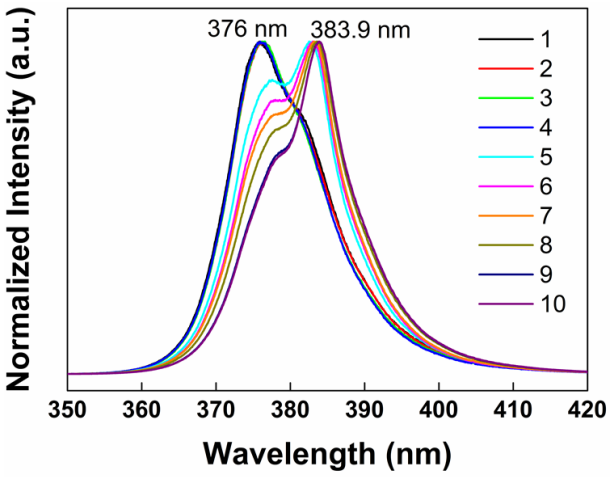

Fig. S3 Intensity-normalized PL spectra obtained along the suspended ZnO NR shown in corresponding colors for each positions in Fig. 1(c) under excitation of D2.

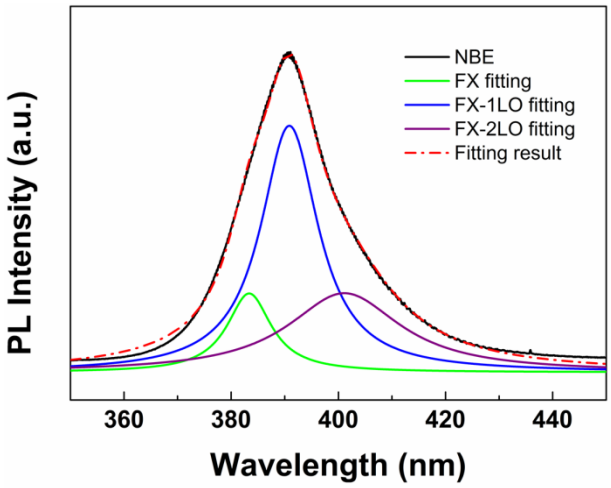

Fig. S4 Fitting result of the NBE peak in the PL spectrum obtained at 473 K.

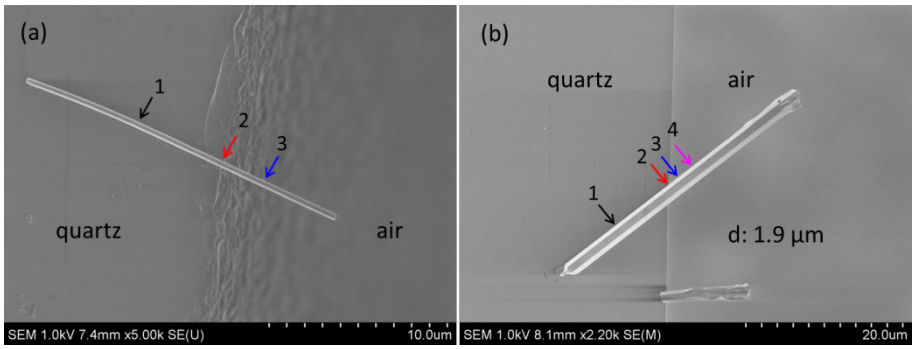

Fig. S5 SEM images of two suspended ZnO NRs with diameters of 355 nm (a) and 1.9 µm (b), respectively; colored arrows indicate the PL measurement positions.

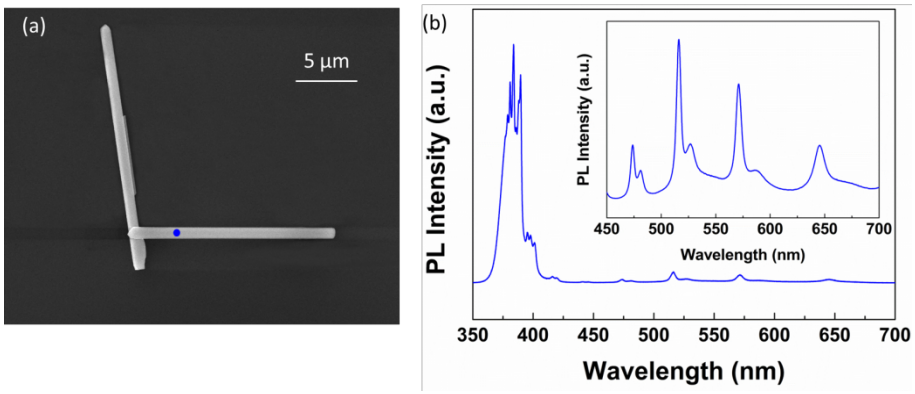

Fig. S6 (a) SEM image of a suspended ZnO NR (horizontal one) with one end lying upon another NR and the other end lying on the substrate. The diameter of this NR is about 920 nm. The blue point exhibits the position where the PL spectra were collected. (b) PL spectra collected at the blue point. The inset shows the PL spectrum in visible region.

Fig. S6(a) shows the SEM image of two ZnO NRs on the substrate. The ZnO NR we measured is the horizontal one, with a diameter of about 920 nm. One end of this NR lies upon another NR which lies totally on the substrate, while the other end contacts with the substrate. The blue point exhibits where the laser is focused and the PL spectra is collected. The corresponding PL spectra obtained at RT are shown in Fig. S6(b). It can be seen that the WGMs appear in the whole region of the spectrum, including the visible region with an relative intensity which is almost negligible. The inset shows the enlarged PL spectrum in visible region. It can be seen that the WGMs exhibit sharp and periodical oscillating peaks in the spectrum, and both TE and TM modes can be observed clearly, which was seldom observed for ZnO NRs totally lying on the substrate in our work before.