Temperature Dependent Raman and Photoluminescence of an Individual Sn-Doped CdS Branched Nanostructure

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Supplementary Information

Figure S1. The EDS spectra of the Sn droplets at the top of CdS-branches. The inset is the corresponding high-magnification SEM image of Sn droplets.

The CdS-comb with Sn droplets is further characterized by EDS, as typically shown in figure S1. The CdS-branches have a Sn droplets diameter of 1.97 μm, the central part of branches width of 835 nm. The EDS spectrum shows that the Sn ball is composed of sulfur, cadmium, and Tin. And apparently, the droplets at the tops of branches are mainly composed of Tin. It reveals that the Tin act as catalysts of VLS growth mechanism.
Figure S2. Raman mapping of LO phonon mode obtained from local CdS comb-like structure that are marked in the inset.

As shown in figure S2, the color in the vertical bar represents the intensity of Raman emission. It reveals that the intensities of LO phonon mode are evenly distributed along the trunk of CdS comb-like structure. Compared to the intensity distribution of 1TO phonon mode, the intensity fluctuation of LO phonon mode at trunk and junction is obviously less than that of 1TO phonon mode. By contrast, the electron-phonon coupling is enhanced by deformation potential in the junction.