

Electronic Supplementary Information

Section S1

Image analysis method

Open source software ImageJ was used for SEM image analysis. For each image, calibration was set according to the scale bar embedded in the image. Histogram equalization was employed to enhance image contrast for easier processing. Subsequently, each image was thresholded to produce 2 binary images with void area represented by pixels with 0 intensity, and solid area represented by pixels with intensity of 255. The binary image was thresholded so that only the top portion of the bundled nanowires was considered solid area. The measurement of perimeter was performed on the binary image, which was subsequently divided by the total area captured in the photo. The values of the perimeter per unit area were analyzed for estimation of the exposed surface area of the clumped nanostructures.