

Supporting Materials

Silicon nanowires nanogenerator based on the piezoelectricity of alpha-quartz

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Figures S1a and S1b are the SEM images of the ordinary SiNWs and the thermal-treated ones respectively. The diameter of the SiNWs is 15-20 nm. There is no obvious difference in morphology and size between these two kinds of SiNWs, judged from the SEM images.

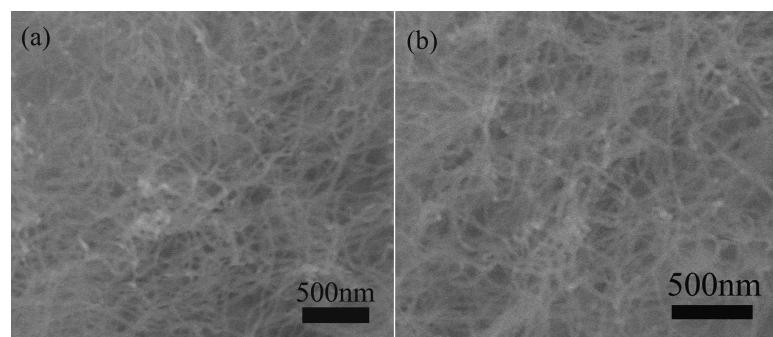


Fig. S1. The SEM images of (a) the ordinary SiNWs and (b) the thermal-treated SiNWs, showing no obvious difference.

Figure S2 is the side view of the thermal-treated SiNW film. From the SEM image, the SiNWs were aligned orientation.

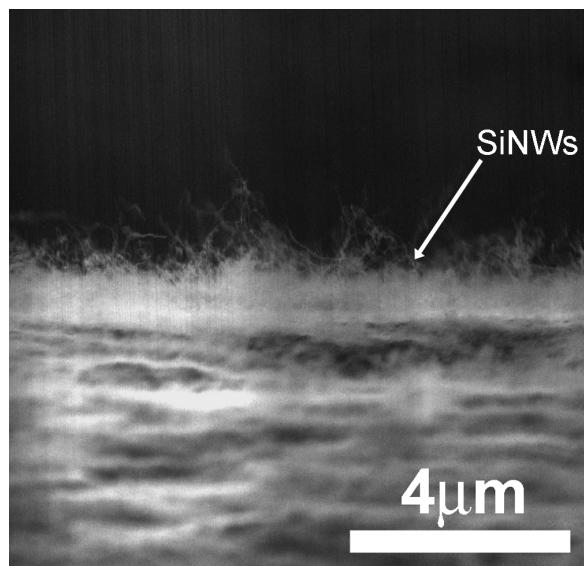


Fig. S2. The side view of the thermal-treated SiNWs, showing aligned orientation.

An experiment was conducted to confirm this phenomenon which shown in Fig. S3. We used the collision induced by a free-falling object with a weight of 300 g at different height ranging from 10 to 30 cm. The corresponding voltage and current were collected.

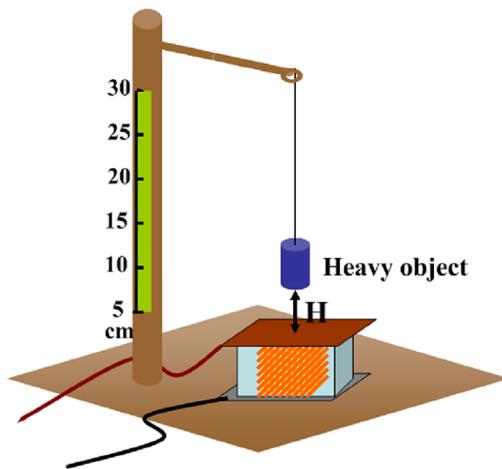


Fig. S3. Schematic diagram of the experiment which to measure the piezoelectric effect of SiNWs.

Figure S4 shows the output current from the control experiment using SiNWs with no thermal treatment. No obvious induced current was detected.

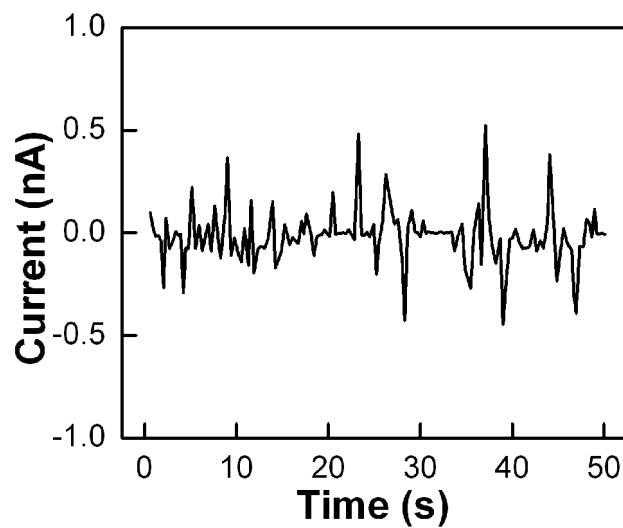


Fig. S4. The output current from the control experiment using SiNWs with no thermal treatment.