**Supporting Information**

**Synthesis and Thermoelectric Characterization of Lead Telluride Hollow Nanofibers**

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**Figure S1**. Low magnification SEM images of synthesized PbxTey hollow nanofibers using 124 nm (top row) and 52 nm (bottom row) Co nanofibers as sacrificial materials. The electrolytes contain a fixed concentration of 0.1 mM HTeO2+and 0.1 M HNO3 with various concentration of Pb2+ of 10 mM (left column), 50 mM (middle column), and 100 mM (right column). The reactions were conducted at room temperature for 30 min. The scale bar represents 1 micron.



**Figure S2**. XRD pattern of PbTe hollow nanofibers using (a) 124 nm and (b) 52 nm Co nanofibers as sacrificial materials. The electrolytes contain a fixed concentration of 0.1 mM HTeO2+and 0.1 M HNO3 with various concentration of Pb+ of 10 Mm, 50 mM, and 100 mM, as labelled. The peaks with red dots and green triangles belong to PbTe and Pt, respectively.



**Figure S3**. (a) Electrical conductivity and (b) energy barrier height Eb of PbTe single nanofibers as a function of outer diameter. Yellow squares and blue circles indicate PbxTey from 52 nm and 124 nm Co nanofibers, respectively.



**Figure S4**. (a) Temperature dependent Seebeck coefficient of Pb43Te57 (solid triangles), Pb42Te58 (solid squares), and Pb37Te63 (solid circles) nanofiber mats reacted from 52 nm Co nanofiber mats. (b) Temperature dependent Seebeck coefficient of Pb43Te57 (open triangles), Pb39Te61 (open squares), and Pb44Te56 (open circles) nanofiber mats reacted from 124 nm Co nanofiber mats. The electrolytes contain a fixed concentration of 0.1 mM HTeO2+and 0.1 M HNO3 with various concentration of Pb+ of 10 mM (triangle), 50 mM (square), and 100 mM (circle). The maximum Seebeck coefficient Smax=Eg/2eTmax is predicted and plotted in the purple lines.



**Figure S5**. Seebeck coefficient of PbTe nanofiber mats as a function of average grain size.