Supporting Information

Large piezoelectricity and high depolarization temperature in $BiScO_3$-$BiYbO_3$-$PbTiO_3$ ceramics for energy harvesting at elevated temperatures

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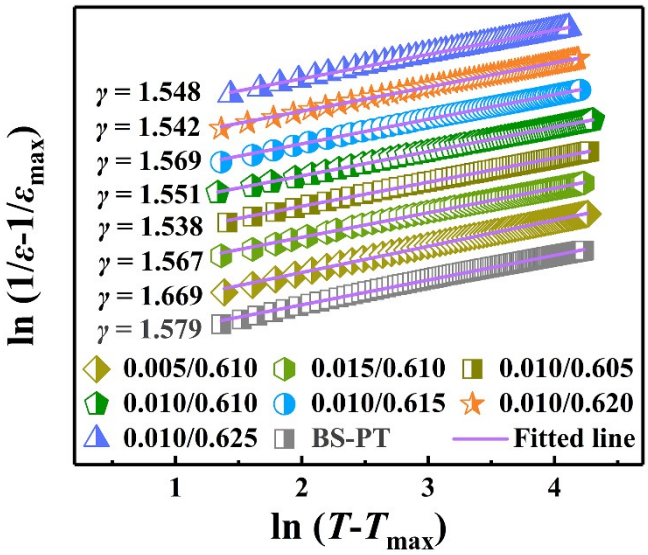

Fig. S1 $\ln(1/\varepsilon\text{-}1/\varepsilon_{max})$ as a function of $\ln(T\text{-}T_{max})$ at 1 kHz for the (1-*x*-*y*)BS-*x*BY-*y*PT ($0.005 \leq x \leq 0.015$, $0.605 \leq y \leq 0.625$) and BS-PT ceramics. The solid lines are the fitting results of Curie-Weiss relationship $1/\varepsilon - 1/\varepsilon_{max} = = (T - T_{max})^{\gamma}/C$.

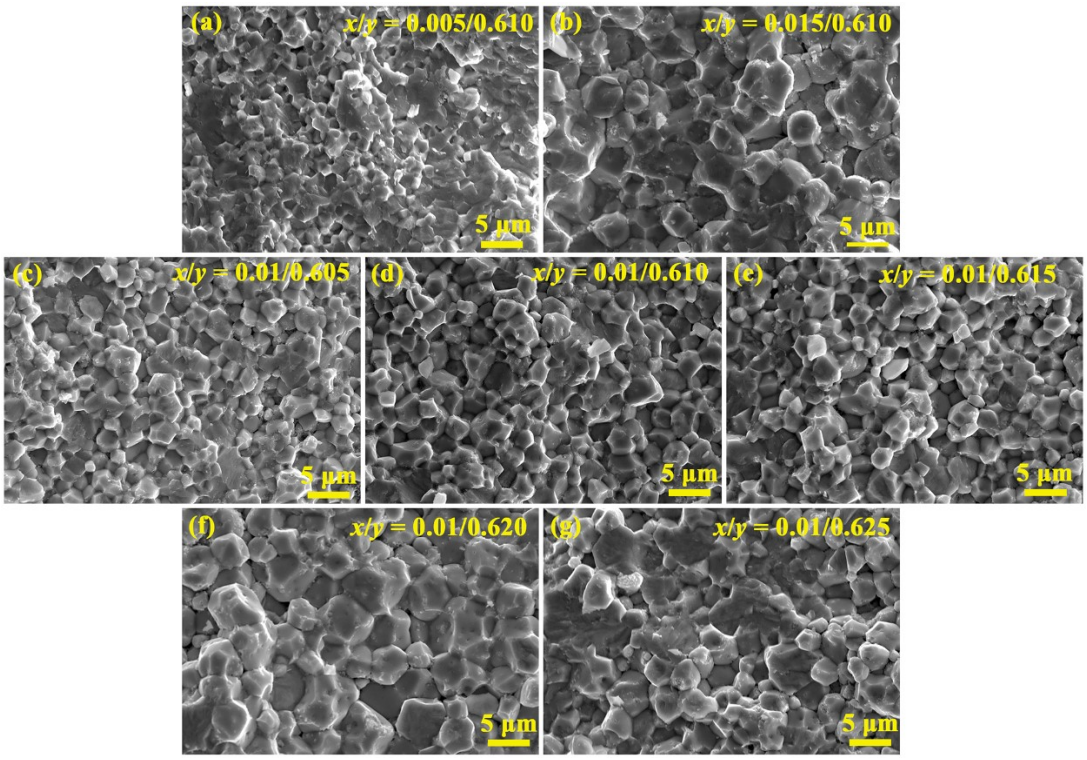

Fig. S2 The SEM images of (1-*x*-*y*)BS-*x*BY-*y*PT ceramics: (a) *x*/*y* = 0.005/0.610, (b) *x*/*y* = 0.015/0.610, (c) *x*/*y* = 0.01/0.605, (d) *x*/*y* = 0.01/0.610, (e) *x*/*y* = 0.01/0.615, (f) *x*/*y* = 0.01/0.620, (g) *x*/*y* = 0.01/0.625.

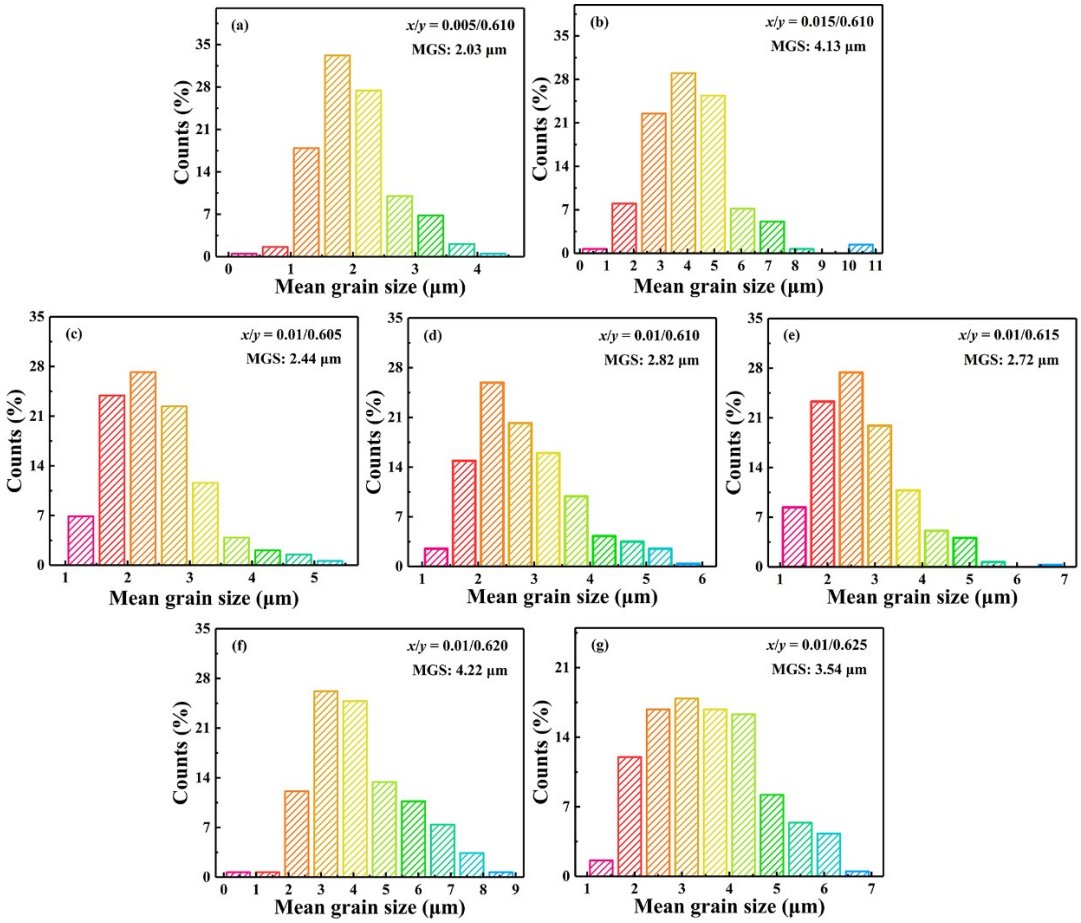

Fig. S3 The mean grain size (MGS) distribution of (1-*x*-*y*)BS-*x*BY-*y*PT ceramics: (a) *x*/*y* = 0.005/0.610, (b) *x*/*y* = 0.015/0.610, (c) *x*/*y* = 0.01/0.605, (d) *x*/*y* = 0.01/0.610, (e) *x*/*y* = 0.01/0.615, (f) *x*/*y* = 0.01/0.620, (g) *x*/*y* = 0.01/0.625.

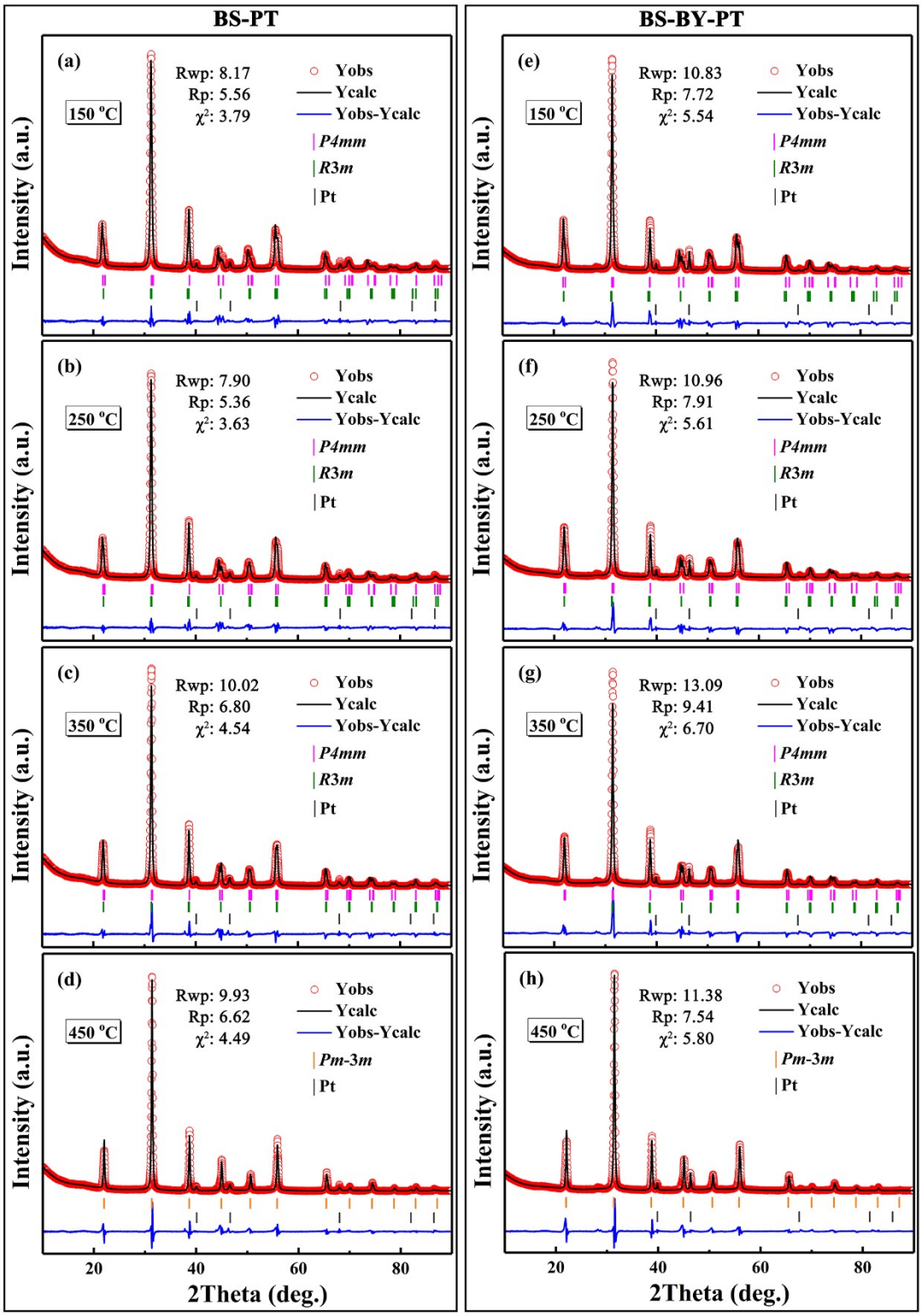

Fig. S4 Rietveld refinement of poled (a-d) BS-PT and (e-h) BS-BY-PT ceramics by an *in situ* XRD test at different temperatures. Pt diffraction peak is caused by the Pt heating substrate in the instrument test.

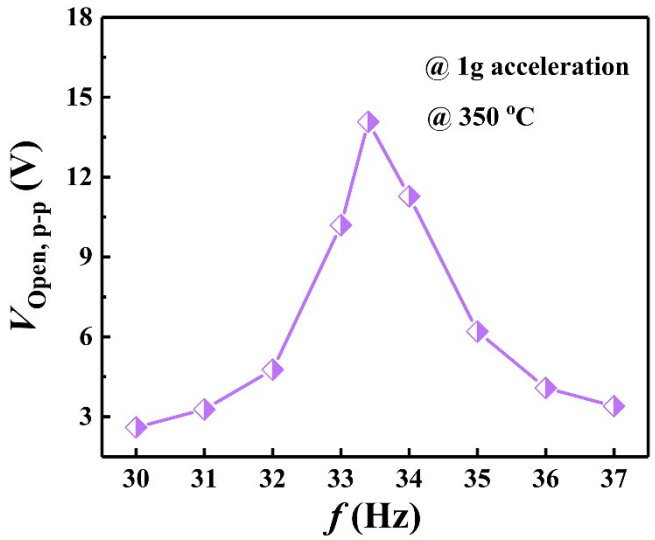

Fig. S5 The frequency-dependent the peak-to-peak value of output open-circuit voltage ($V_{Open, p-p}$) for the BS-BY-PT HT-PEH under 1g acceleration excitation at 350 °C.

The peak-to-peak value of output open-circuit voltage ($V_{Open, p-p}$) of BS-BY-PT HT-PEH increases first and then decreases with test frequency (f), and reaches the maximum value at ~33.4 Hz, which is recorded as the resonant frequency of the BS-BY-PT HT-PEH.

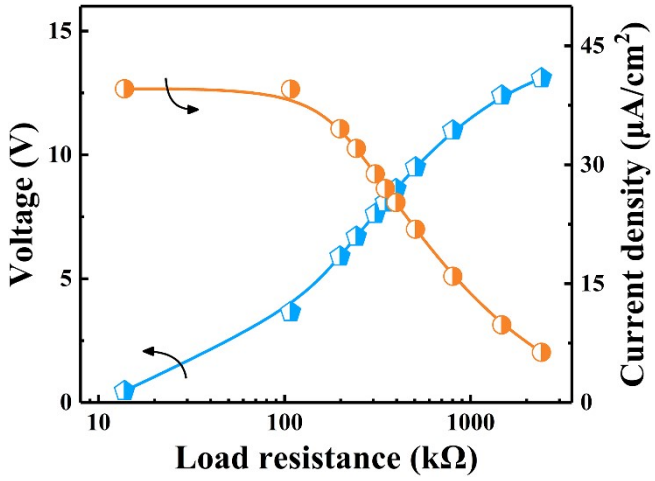

Fig. S6 The load resistance-dependent output voltage and current density for the BS-BY-PT HT-PEH under 1g acceleration excitation at 350 °C.

When the load resistance of the connection increases, the voltage of the BS-BY-PT HT-PEH increases while the current density decreases, which conforms to Ohm's law.