Electronic supplementary information

Tailored fabrication of a prospective acousto-optic crystal $TiTe_3O_8$ endowed with high performance

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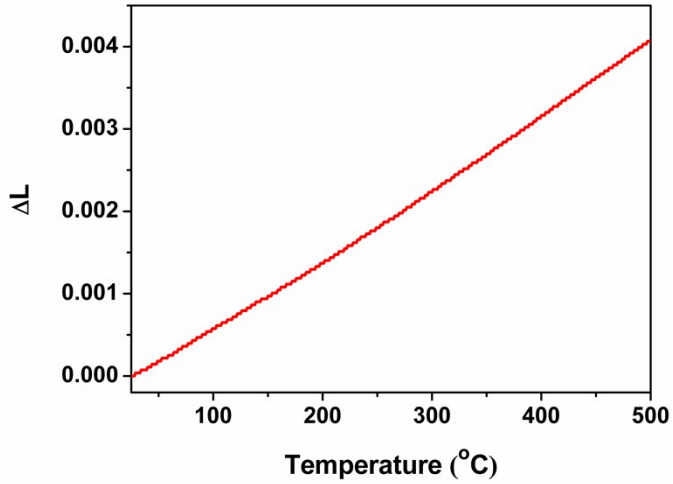

Fig. S1 Temperature dependence of thermal expansion for $TiTe_3O_8$ along the crystallography *a*-axis.

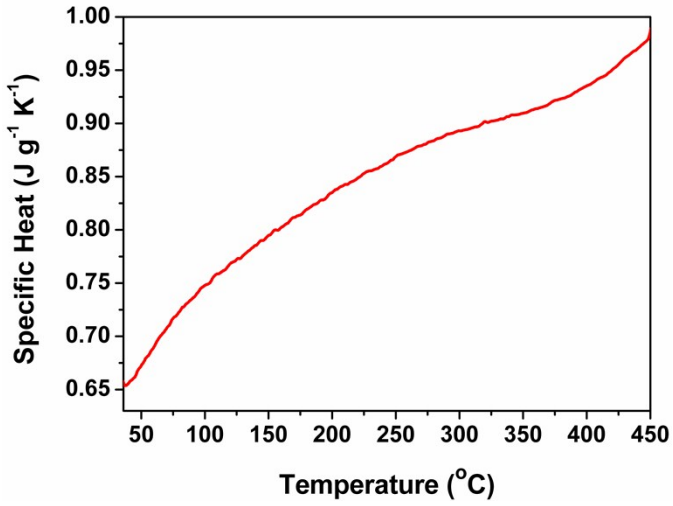

Fig. S2 Temperature dependence of specific heat for $TiTe_3O_8$.

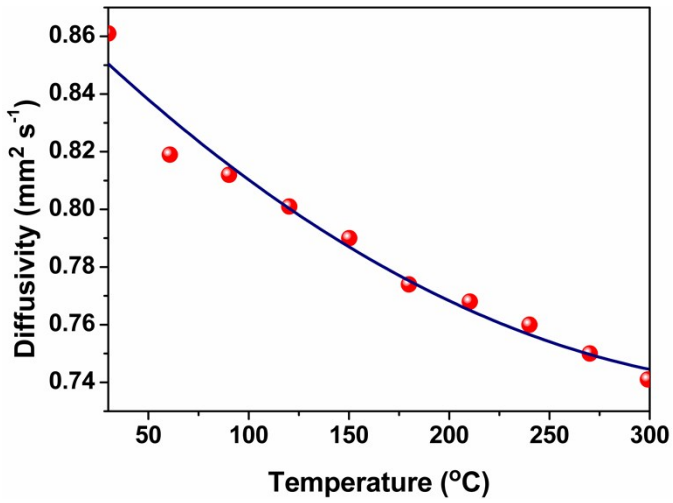

Fig. S3 Thermal diffusivity as a function of temperature for $TiTe_3O_8$ along the crystallography *a*-axis.

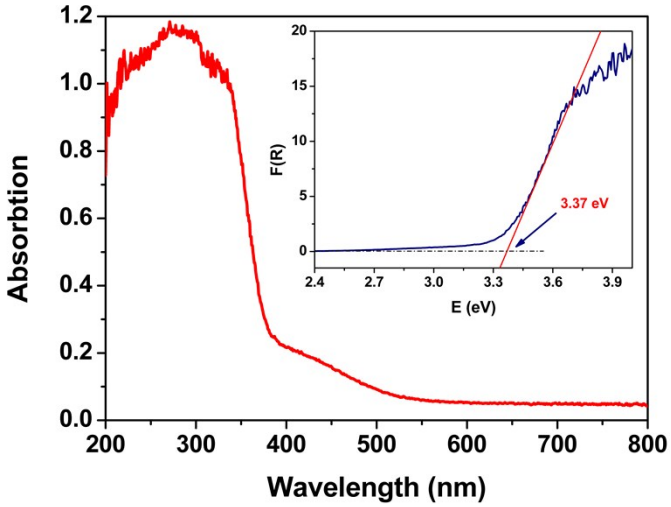

Fig. S4 UV−visible diffuse reflectance spectra data for ground powders of the $TiTe_3O_8$ crystal. The inset shows the relationship between (α/S) and E (eV).

Table S1 Selected bond lengths (Å) and angles (deg.) in $TiTe_3O_8$.

Te1–O1^{i}	1.884(2)	Ti1–O1^{i}	1.952(2)
Te1–O1^{ii}	1.884(2)	Ti1–O1^{vii}	1.952(2)
Te1–O2	2.1185(7)	Ti1–O1^{viii}	1.952(2)
Te1–O2^{iii}	2.1185(7)	O2–Te1^{ix}	2.1185(7)
Ti1–O1^{iv}	1.952(2)	O2–Te1^{x}	2.1185(7)
Ti1–O1^{v}	1.952(2)	O1–Te1^{xi}	1.884(2)
Ti1–O1^{vi}	1.952(2)	O1–Ti1^{xii}	1.952(2)
O1^{i}–Te1–O1^{ii}	101.79(16)	O1^{v}–Ti1–O1^{vii}	91.81(9)
O1^{i}–Te1–O2	86.02(13)	O1^{vi}–Ti1–O1^{vii}	88.19(9)
O1^{ii}–Te1–O2	79.99(8)	O1^{i}–Ti1–O1^{vi}	91.81(9)
O1^{i}–Te1–O2^{iii}	79.99(8)	O1^{iv}–Ti1–O1^{viii}	91.81(9)
O1^{ii}–Te1–O2^{iii}	86.02(13)	O1^{v}–Ti1–O1^{viii}	88.19(9)
O2–Te1–O2^{iii}	157.76(13)	O1^{vi}–Ti1–O1^{viii}	91.81(9)
O1^{iv}–Ti1–O1^{v}	180.0(2)	O1i–Ti1–O1^{viii}	88.19(9)
O1^{iv}–Ti1–O1^{vi}	91.81(9)	O1^{vii}–Ti1–O1^{viii}	180.0(2)
O1^{v}–Ti1–O1^{vi}	88.19(9)	Te1^{ix}–O2–Te1	116.86(6)
O1^{iv}–Ti1–O1^{i}	88.19(9)	Te1^{ix}–O2–Te1^{x}	116.86(6)
O1^{v}–Ti1–O1^{i}	91.81(9)	Te1–O2–Te1^{x}	116.86(6)
O1^{vi}–Ti1–O1^{i}	180.0(2)	Te1^{xi}–O1–Ti1^{xii}	138.28(13)
O1^{iv}–Ti1–O1^{vii}	88.19(9)		

Symmetry codes: (i) y−1/2, −z+1/2, −x; (ii) −y+1/2, z, −x; (iii) −x, −y+1/2, z; (iv) x, −y+1/2, z−1/2; (v) −x, y−1/2, −z+1/2; (vi) −y+1/2, z−1/2, x; (vii) −z+1/2, −x, y−1/2; (viii) z−1/2, x, −y+1/2; (ix) y, z, x; (x) z, x, y; (xi) −z, −x+1/2, y; (xii) −x, y+1/2, −z+1/2.

Table S2 Measured values for the refractive indices of $TiTe_3O_8$ at different wavelengths.

λ (nm)	n
546.075	2.382467
587.562	2.359446
643.847	2.336531
706.519	2.318121
852.11	2.291467
1013.98	2.274489
1529.58	2.252335
2325.42	2.231389