Supporting Information

Crystal Growth of Metal Tellurides from a Boron-Tellurium Mixture: MTr_2Te_4 (M = Sr, Eu; Tr = In, Ga)

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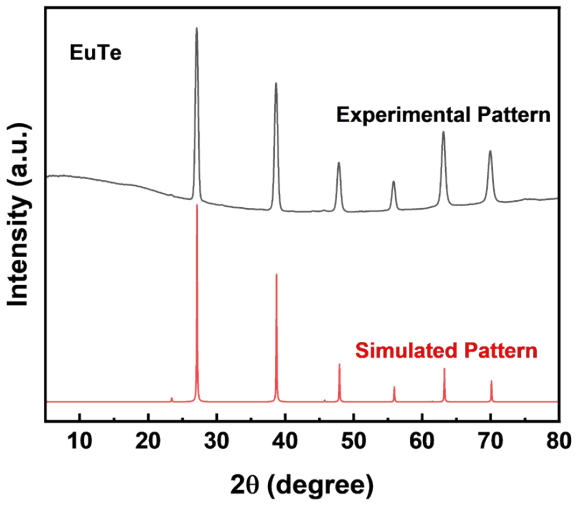

Figure S1. Simulated (red) and experimental (black) PXRD pattern of polycrystalline EuTe.

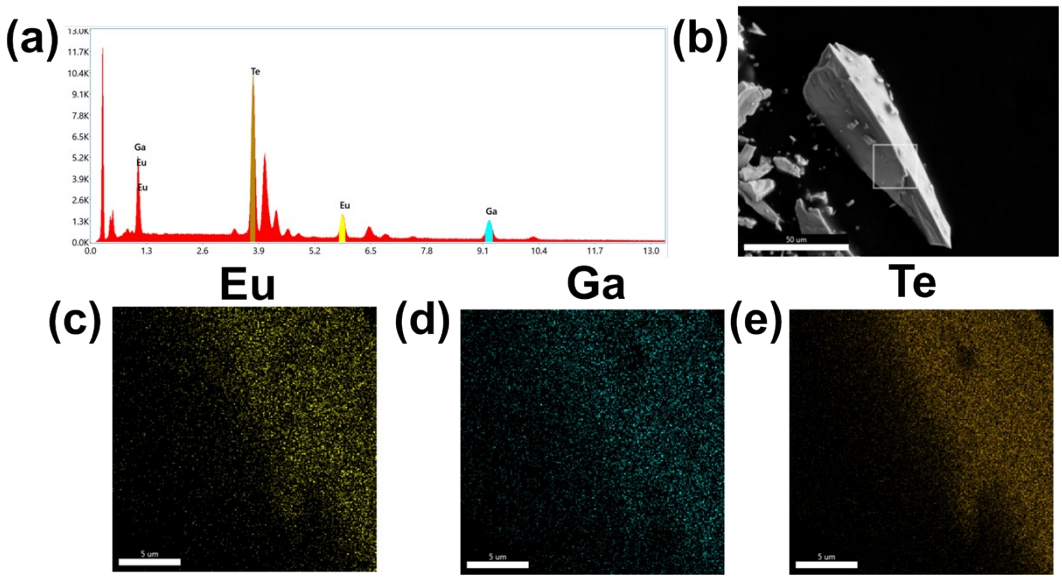

Figure S2. (a) EDX spectrum and (b-e) elemental mapping of a *β*-$EuGa_2Te_4$ crystal.

Table S1. EDX composition of selected *β*-$EuGa_2Te_4$ crystal.

Element	Weight %	MDL	Atomic%	Error%
Ga	18.97	0.62	30.79	4.77
Te	62.42	0.37	55.36	3.61
Eu	18.61	0.64	13.85	6.32

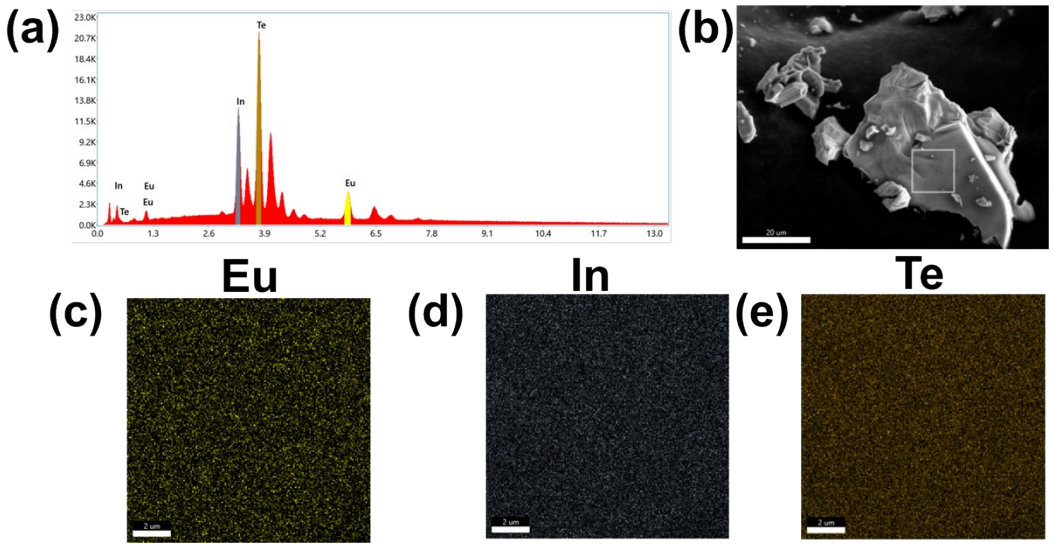

Figure S3. (a) EDX spectrum and (b-e) elemental mapping of a *α*-$EuIn_2Te_4$ crystal.

Table S2. EDX composition of selected *α*-$EuIn_2Te_4$ crystal.

Element	Weight %	MDL	Atomic%	Error%
In	23.01	0.19	25.66	4.19
Te	58.88	0.24	59.08	4.00
Eu	18.12	0.39	15.26	5.05

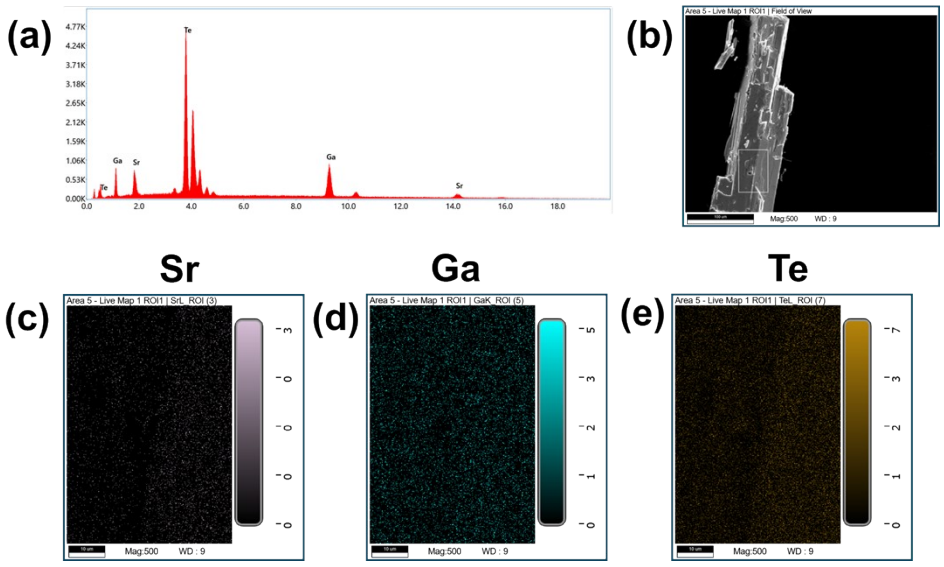

Figure S4. (a) EDX spectrum and (b-e) elemental mapping of a $SrGa_2Te_4$ crystal.

Table S3. EDX composition of selected $SrGa_2Te_4$ crystal.

Element	Weight %	MDL	Atomic%	Error%
Ga	19.11	0.48	29.00	4.29
Sr	10.31	0.76	12.46	11.01
Te	70.58	0.52	58.54	4.78

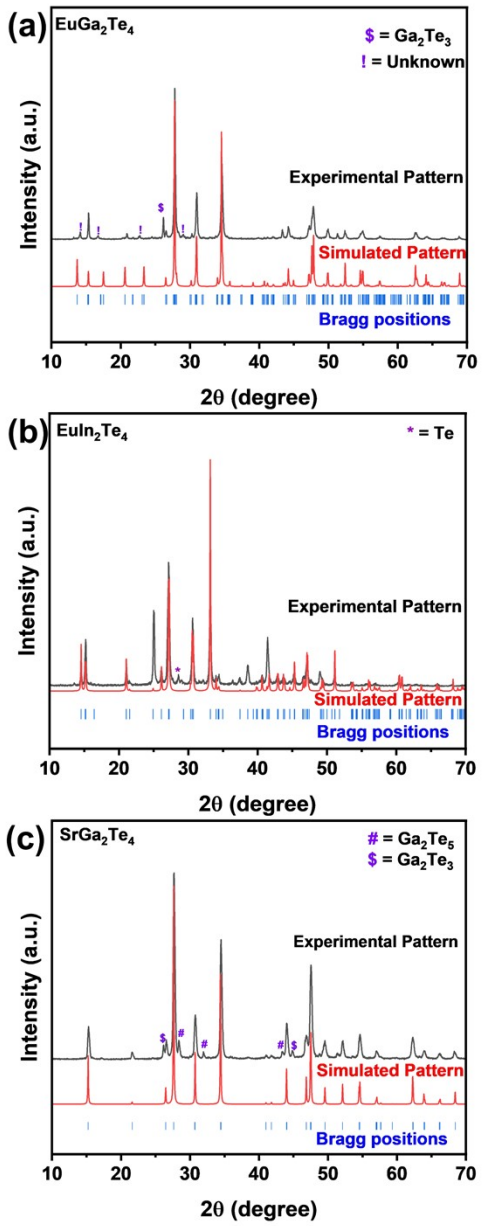

Figure S5. Simulated (red) and experimental (black) powder X-ray diffraction (PXRD) patterns of polycrystalline (a) *β*-$EuGa_2Te_4$, (b) *α*-$EuIn_2Te_4$, and (c) $SrGa_2Te_4$ samples. Respective Bragg positions are shown in blue colored vertical bars.

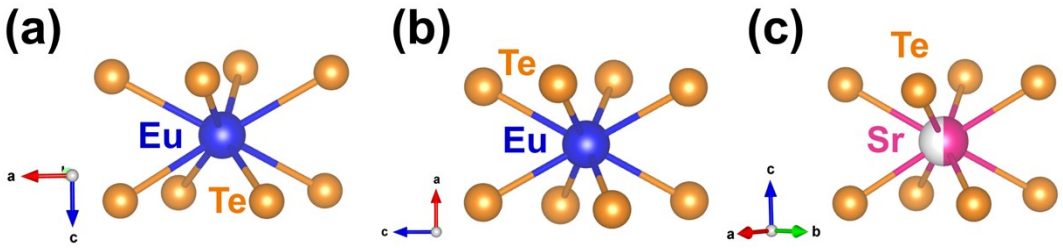

Figure S6. View of *A* centered polyhedral unit in (a) *β*-$EuGa_2Te_4$, (b) *α*-$EuIn_2Te_4$, and (c) $SrGa_2Te_4$ crystal structures.

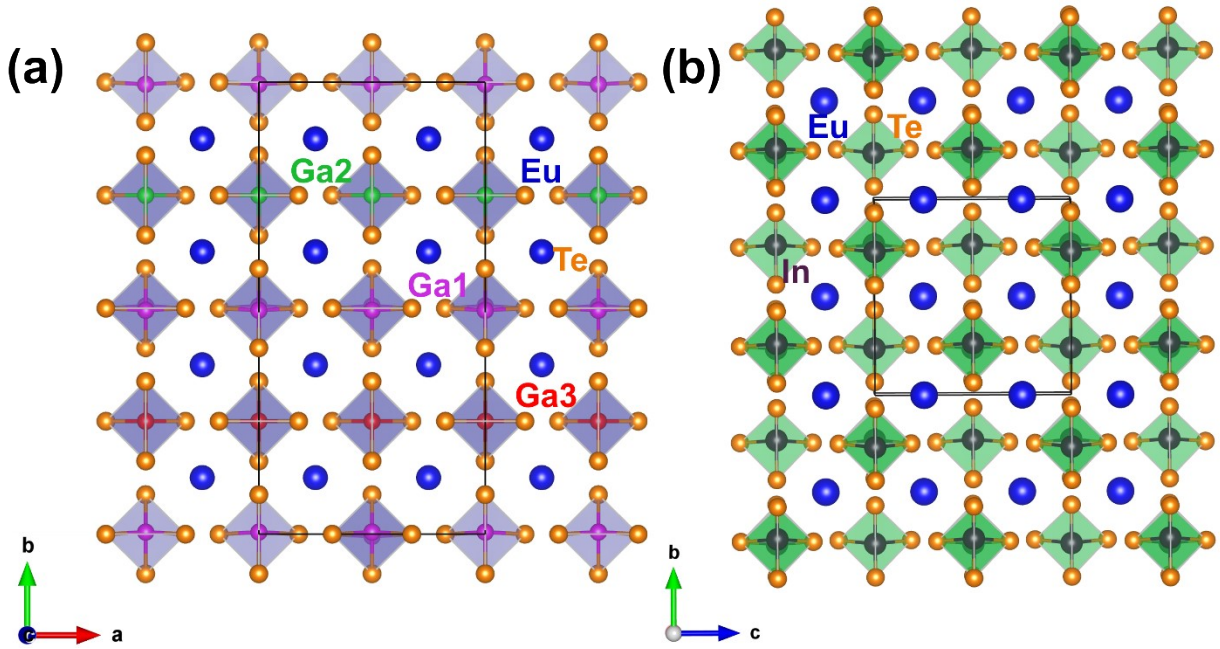

Figure S7. View of the slice of unit cells of (a) *β*-$EuGa_2Te_4$ and (b) *α*-$EuIn_2Te_4$ approximately along the *c*-direction and *a*-direction, respectively.

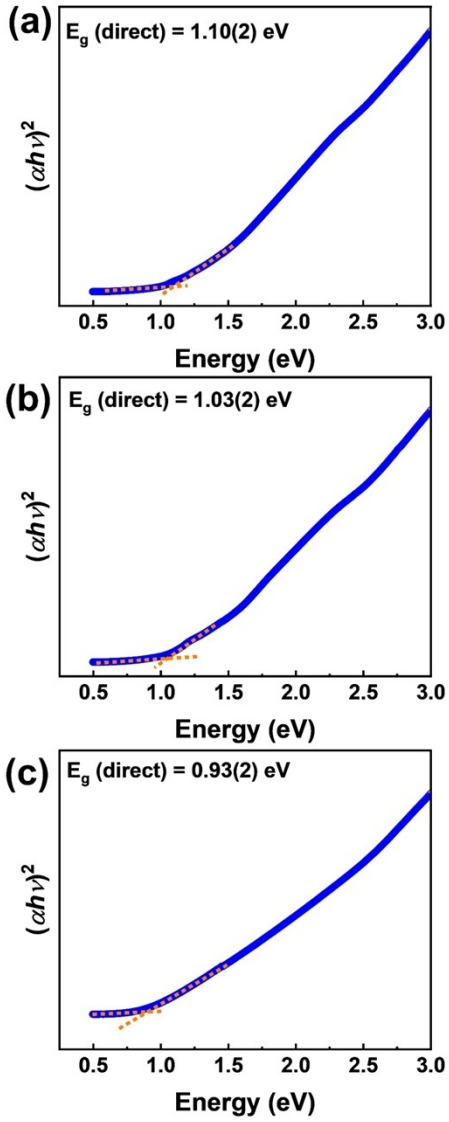

Figure S8. Tauc plots of the direct band transitions for (a) *β*-$EuGa_2Te_4$, (b) *α*-$EuIn_2Te_4$, and (c) $SrGa_2Te_4$.

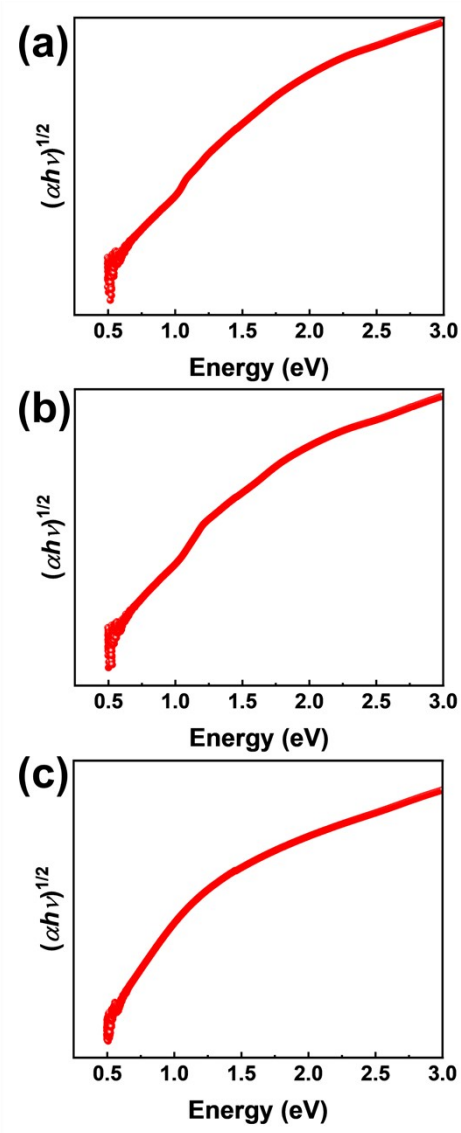

Figure S9. Tauc plots of the indirect optical transitions for (a) β-$EuGa_2Te_4$, (b) α-$EuIn_2Te_4$, and (c) $SrGa_2Te_4$.

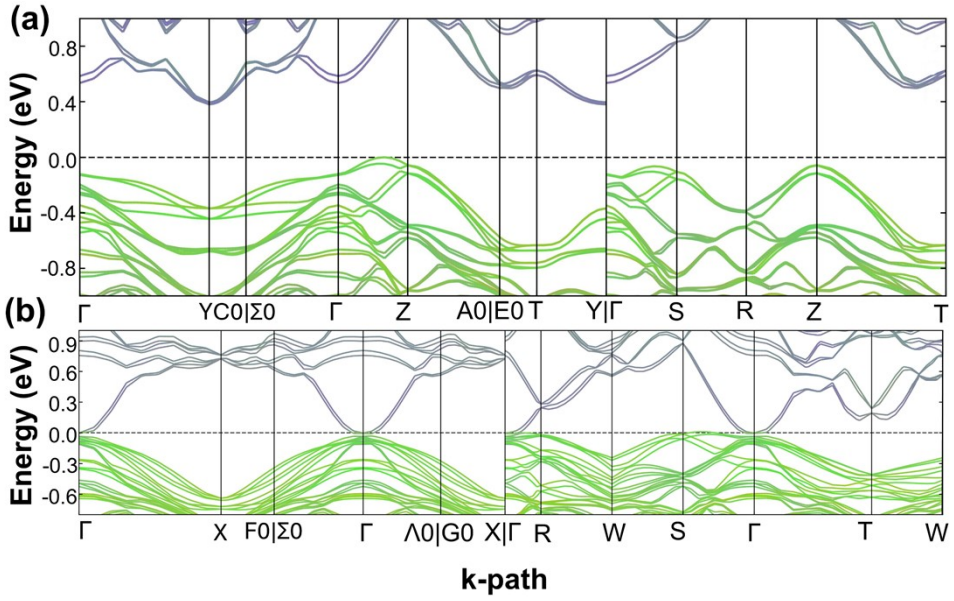

Figure S11. Calculated band structures of β-$EuGa_2Te_4$ (lower) and α-$EuIn_2Te_4$ (upper) near the band edges. The Fermi energy level is labeled at 0 eV by the black dotted lines.

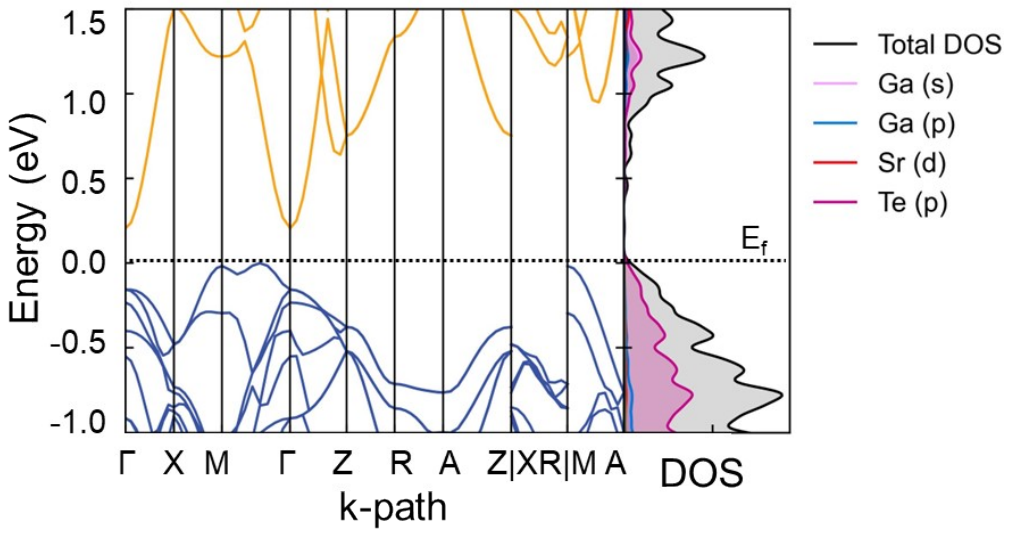

Figure S10. Plot of the calculated band structure (left) and density-of-states (DOS) (right) for $SrGa_2Te_4$ near the band edges. The Fermi energy level is labeled at 0 eV by the black dotted line. Individual atomic contributions to the DOS are shown as colored lines.

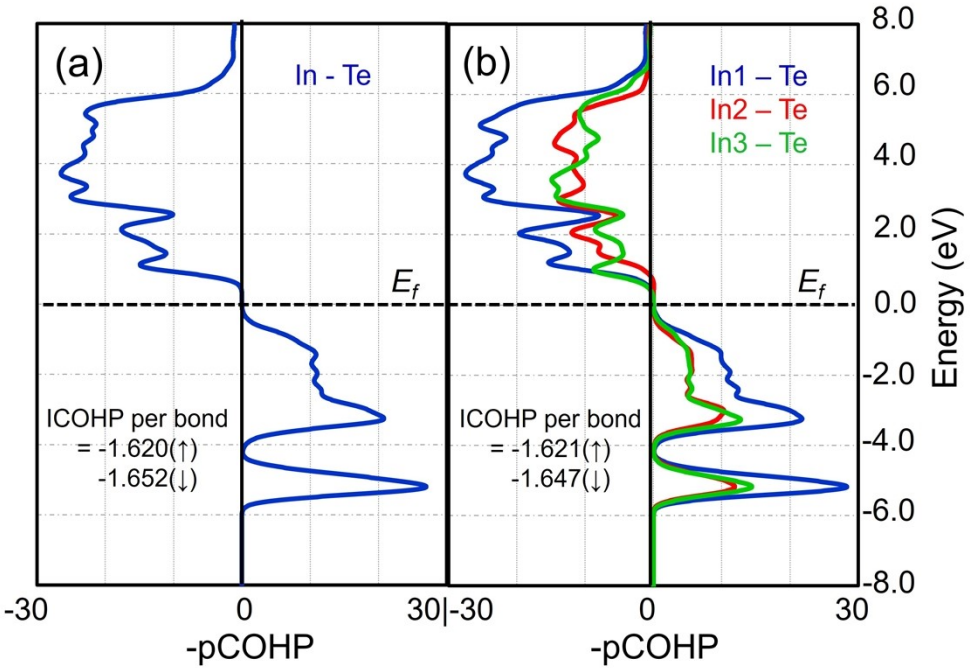

Figure S12. The calculated Crystal Orbital Hamilton Populations (COHP) for the pairwise In-Te interactions in *α*-$EuIn_2Te_4$ (a; **2**) and *β*-$EuIn_2Te_4$ (b; hypothetical), with the Fermi levels (E_f) given as dashed lines at 0 eV. Positive and negative values indicate bonding and antibonding interactions, respectively.

Table S4: Fractional atomic coordinates, site symmetries, Wyckoff positions, and equivalent isotropic displacement parameters (Å^2) for *β*-$EuGa_2Te_4$ (upper), *α*-$EuIn_2Te_4$ (middle), and $SrGa_2Te_4$ (lower) crystal structures.

Atom	Wyckoff Position	*x*	*y*	*z*	U_{eq}	Occ. (<1)
Eu1	8*g*	0.250000	0.12520(2)	0.250000	0.01930(12)	
Ga1	8*h*	0.000000	0.50463(3)	0.25127(8)	0.01405(17)	
Ga2	4*e*	0.000000	0.250000	0.25243(10)	0.0141(2)	
Ga3	4*e*	0.000000	0.250000	0.75240(10)	0.0151(2)	
Te1	8*i*	0.17568(4)	0.250000	0.00271(4)	0.01390(13)	
Te2	8*h*	0.000000	0.08754(2)	0.01411(4)	0.01369(12)	
Te3	8*h*	0.000000	0.16203(2)	0.50221(4)	0.01412(13)	
Te4	8*f*	0.32429(4)	0.000000	0.000000	0.01417(13)	
Eu1	4*a*	0.000000	0.000000	0.250000	0.02041(15)	
In1	8*l*	0.49723(9)	0.23416(6)	0.500000	0.01807(14)	
Te1	8*l*	0.22775(8)	0.06642(5)	0.000000	0.01616(14)	
Te2	8*k*	0.250000	0.250000	0.31520(5)	0.01724(14)	
Sr1	4*a*	0.000000	0.000000	0.250000	0.0191(4)	0.5
Ga1	4*b*	0.000000	0.500000	0.250000	0.0177(3)	
Te1	8*h*	0.17407(3)	0.67407(3)	0.000000	0.0151(2)	

Table S5. Atomic displacement parameters (Å^2) for *β*-$EuGa_2Te_4$.

	U^{11}	U^{22}	U^{33}	U^{12}	U^{13}	U^{23}
Eu1	0.01633(17)	0.01574(17)	0.02581(19)	0.000	-0.00075(9)	0.000
Ga1	0.0167(4)	0.0148(3)	0.0106(3)	0.000	0.000	0.00076(16)
Ga2	0.0164(5)	0.0153(4)	0.0105(4)	0.000	0.000	0.000

Ga3	0.0179(5)	0.0171(4)	0.0104(4)	0.000	0.000	0.000
Te1	0.0128(3)	0.0158(2)	0.0131(2)	0.000	-0.00028(9)	0.000
Te2	0.0155(3)	0.0123(2)	0.01328(19)	0.000	0.000	-0.00106(11)
Te3	0.0164(3)	0.0120(2)	0.0140(2)	0.000	0.000	-0.00046(9)
Te4	0.0125(3)	0.0164(2)	0.0136(2)	0.000	0.000	-0.00284(10)

Table S6. Atomic displacement parameters (Å^2) for α-$EuIn_2Te_4$.

	U^{11}	U^{22}	U^{33}	U^{12}	U^{13}	U^{23}
Eu1	0.0270(3)	0.0185(3)	0.0157(3)	0.000	0.000	0.000
In1	0.0128(2)	0.0212(3)	0.0202(3)	0.0017(2)	0.000	0.000
Te1	0.0166(2)	0.0143(3)	0.0175(3)	-0.00181(19)	0.000	0.000
Te2	0.0172(2)	0.0207(3)	0.0139(3)	-0.00357(18)	0.000	0.000

Table S7. Atomic displacement parameters (Å^2) for $SrGa_2Te_4$.

	U^{11}	U^{22}	U^{33}	U^{12}	U^{13}	U^{23}
Sr1	0.0155(6)	0.0155(6)	0.0262(9)	0.000	0.000	0.000
Ga1	0.0210(4)	0.0210(4)	0.0112(5)	0.000	0.000	0.000
Te1	0.0142(2)	0.0142(2)	0.0169(3)	-0.00166(17)	0.000	0.000

Table S8. Geometric parameters (Å, º) for β-$EuGa_2Te_4$.

Eu1—Te1	3.4339 (3)	Ga1—Te4^{vi}	2.6325 (5)
Eu1—Te1^{i}	3.4339 (3)	Ga1—Te4^{i}	2.6325 (5)
Eu1—Te2	3.4086 (2)	Ga2—Te1^{v}	2.6341 (6)
Eu1—Te2^{ii}	3.4086 (2)	Ga2—Te1	2.6342 (6)
Eu1—Te3	3.4562 (2)	Ga2—Te3^{v}	2.6337 (5)
Eu1—Te3^{ii}	3.4562 (2)	Ga2—Te3	2.6337 (5)
Eu1—Te4^{iii}	3.4503 (3)	Ga3—Te1^{vii}	2.6367 (6)
Eu1—Te4	3.4503 (3)	Ga3—Te1^{viii}	2.6367 (6)
Ga1—Te2^{iv}	2.6151 (7)	Ga3—Te3	2.6355 (6)
Ga1—Te2^{v}	2.6575 (7)	Ga3—Te3^{v}	2.6355 (6)
Te1—Eu1—Te1^{i}	66.009 (10)	Te3^{v}—Ga2—Te1	113.944 (6)
Te1—Eu1—Te3	79.734 (9)	Te3—Ga2—Te1	113.944 (5)
Te1^{i}—Eu1—Te3	76.454 (10)	Te3^{v}—Ga2—Te1^{v}	113.945 (5)
Te1—Eu1—Te3^{ii}	76.453 (10)	Te3—Ga2—Te1^{v}	113.944 (5)
Te1^{i}—Eu1—Te3^{ii}	79.733 (9)	Te3^{v}—Ga2—Te3	100.83 (3)
Te1—Eu1—Te4^{iii}	151.098 (10)	Te1^{vii}—Ga3—Te1^{viii}	100.74 (3)
Te1^{i}—Eu1—Te4^{iii}	121.932 (5)	Te3—Ga3—Te1^{viii}	114.005 (6)
Te1^{i}—Eu1—Te4	151.097 (10)	Te3^{v}—Ga3—Te1^{vii}	114.006 (6)
Te1—Eu1—Te4	121.932 (5)	Te3—Ga3—Te1^{vii}	114.005 (6)
Te2^{ii}—Eu1—Te1	130.610 (10)	Te3^{v}—Ga3—Te1^{viii}	114.006 (6)
Te2^{ii}—Eu1—Te1^{i}	77.097 (9)	Te3^{v}—Ga3—Te3	100.74 (3)
Te2—Eu1—Te1	77.097 (9)	Eu1—Te1—Eu1^{i}	113.992 (10)
Te2—Eu1—Te1^{i}	130.610 (10)	Ga2—Te1—Eu1^{i}	83.380 (8)
Te2—Eu1—Te2^{ii}	150.459 (15)	Ga2—Te1—Eu1	83.380 (8)

Te2—Eu1—Te3	65.276 (7)	Ga2—Te1—Ga3^{ix}	79.19 (2)
Te2^{ii}—Eu1—Te3^{ii}	65.277 (7)	Ga3^{ix}—Te1—Eu1^{i}	120.086 (8)
Te2^{ii}—Eu1—Te3	122.932 (6)	Ga3^{ix}—Te1—Eu1	120.086 (8)
Te2—Eu1—Te3^{ii}	122.932 (6)	Eu1^{x}—Te2—Eu1	115.952 (10)
Te2—Eu1—Te4	76.773 (10)	Ga1^{v}—Te2—Eu1	85.713 (10)
Te2^{ii}—Eu1—Te4^{iii}	76.773 (10)	Ga1^{xi}—Te2—Eu1	120.233 (7)
Te2^{ii}—Eu1—Te4	78.573 (9)	Ga1^{xi}—Te2—Eu1^{x}	120.233 (7)
Te2—Eu1—Te4^{iii}	78.573 (9)	Ga1^{v}—Te2—Eu1^{x}	85.712 (10)
Te3—Eu1—Te3^{ii}	151.528 (15)	Ga1^{xi}—Te2—Ga1^{v}	79.83 (2)
Te4—Eu1—Te3^{ii}	76.062 (9)	Eu1—Te3—Eu1^{x}	113.472 (9)
Te4—Eu1—Te3	130.745 (10)	Ga2—Te3—Eu1	82.942 (9)
Te4^{iii}—Eu1—Te3^{ii}	130.745 (10)	Ga2—Te3—Eu1^{x}	82.942 (9)
Te4^{iii}—Eu1—Te3	76.061 (9)	Ga2—Te3—Ga3	79.21 (2)
Te4^{iii}—Eu1—Te4	66.289 (8)	Ga3—Te3—Eu1	120.139 (8)
Te2^{iv}—Ga1—Te2^{v}	100.17 (2)	Ga3—Te3—Eu1^{x}	120.140 (8)
Te2^{iv}—Ga1—Te4^{vi}	117.551 (16)	Eu1^{xii}—Te4—Eu1	151.176 (14)
Te2^{iv}—Ga1—Te4^{i}	117.551 (16)	Ga1^{i}—Te4—Eu1^{xii}	117.845 (15)
Te4^{vi}—Ga1—Te2^{v}	110.373 (17)	Ga1^{i}—Te4—Eu1	85.240 (13)
Te4^{i}—Ga1—Te2^{v}	110.373 (17)	Ga1^{xiii}—Te4—Eu1	117.844 (15)
Te4^{i}—Ga1—Te4^{vi}	100.99 (2)	Ga1^{xiii}—Te4—Eu1^{xii}	85.240 (13)
Te1^{v}—Ga2—Te1	100.87 (3)	Ga1^{i}—Te4—Ga1^{xiii}	79.01 (2)

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

Table S9. Geometric parameters (Å, º) for α-$EuIn_2Te_4$.

Eu1—Te1	3.4325 (4)	Eu1—Te2^{iv}	3.4960 (2)
Eu1—Te1^{i}	3.4325 (4)	Eu1—Te2^{v}	3.4960 (2)
Eu1—Te1^{ii}	3.4325 (4)	In1—Te1^{vi}	2.7679 (9)
Eu1—Te1^{iii}	3.4325 (4)	In1—Te1^{vii}	2.8441 (9)
Eu1—Te2	3.4960 (2)	In1—Te2	2.7958 (6)
Eu1—Te2^{iii}	3.4960 (2)	In1—Te2^{viii}	2.7958 (7)
Te1—Eu1—Te1^{ii}	63.263 (17)	Te2—Eu1—Te2^{v}	154.81 (2)
Te1^{ii}—Eu1—Te1^{iii}	123.450 (18)	Te2^{v}—Eu1—Te2^{iii}	118.602 (6)
Te1—Eu1—Te1^{iii}	153.99 (2)	Te2^{v}—Eu1—Te2^{iv}	67.439 (8)
Te1—Eu1—Te1^{i}	123.450 (18)	Te2—Eu1—Te2^{iii}	67.439 (8)
Te1^{ii}—Eu1—Te1^{i}	153.98 (2)	Te2^{iv}—Eu1—Te2^{iii}	154.81 (2)
Te1^{i}—Eu1—Te1^{iii}	63.263 (17)	Te1^{vi}—In1—Te1^{vii}	99.46 (3)
Te1^{i}—Eu1—Te2^{v}	82.472 (12)	Te1^{vi}—In1—Te2^{viii}	119.622 (18)
Te1^{iii}—Eu1—Te2^{iii}	75.912 (15)	Te1^{vi}—In1—Te2	119.622 (19)
Te1—Eu1—Te2^{iii}	82.472 (12)	Te2^{viii}—In1—Te1^{vii}	108.15 (2)
Te1—Eu1—Te2^{iv}	76.098 (16)	Te2—In1—Te1^{vii}	108.15 (2)
Te1^{ii}—Eu1—Te2^{v}	75.912 (15)	Te2^{viii}—In1—Te2	101.20 (3)
Te1^{i}—Eu1—Te2^{iv}	75.912 (15)	Eu1^{ii}—Te1—Eu1	116.737 (17)
Te1^{iii}—Eu1—Te2^{v}	76.098 (16)	In1^{vi}—Te1—Eu1^{ii}	119.648 (10)
Te1—Eu1—Te2	75.912 (15)	In1^{ix}—Te1—Eu1	84.805 (14)
Te1^{ii}—Eu1—Te2^{iv}	82.472 (12)	In1^{ix}—Te1—Eu1^{ii}	84.805 (14)
Te1^{ii}—Eu1—Te2	127.929 (11)	In1^{vi}—Te1—Eu1	119.648 (10)
Te1^{iii}—Eu1—Te2^{iv}	127.929 (11)	In1^{vi}—Te1—In1^{ix}	80.54 (3)
Te1^{i}—Eu1—Te2	76.099 (16)	Eu1—Te2—Eu1^{x}	154.81 (2)
Te1^{i}—Eu1—Te2^{iii}	127.929 (11)	In1—Te2—Eu1	115.845 (17)

Te1^{iii}—Eu1—Te2	82.472 (12)	In1—Te2—Eu1^{x}	84.318 (15)
Te1—Eu1—Te2^{v}	127.929 (11)	In1^{viii}—Te2—Eu1^{x}	115.846 (17)
Te1^{ii}—Eu1—Te2^{iii}	76.098 (16)	In1^{viii}—Te2—Eu1	84.318 (15)
Te2—Eu1—Te2^{iv}	118.602 (6)	In1—Te2—In1^{viii}	78.80 (3)

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

Table S10. Geometric parameters (Å, º) for $SrGa_2Te_4$.

Sr1—Sr1^{i}	3.3635 (2)	Sr1—Te1^{viii}	3.4715 (2)
Sr1—Sr1^{ii}	3.3635 (3)	Sr1—Te1^{ix}	3.4715 (2)
Sr1—Te1^{iii}	3.4715 (2)	Sr1—Te1^{x}	3.4715 (2)
Sr1—Te1^{iv}	3.4715 (2)	Ga1—Te1^{x}	2.6309 (3)
Sr1—Te1^{v}	3.4715 (2)	Ga1—Te1^{v}	2.6309 (3)
Sr1—Te1^{vi}	3.4715 (2)	Ga1—Te1	2.6309 (3)
Sr1—Te1^{vii}	3.4715 (2)	Ga1—Te1^{xi}	2.6309 (3)
Sr1^{i}—Sr1—Sr1^{ii}	180.0	Te1^{iv}—Sr1—Te1^{vii}	131.325 (12)
Sr1^{ii}—Sr1—Te1^{v}	118.976 (2)	Te1^{ix}—Sr1—Te1^{iv}	78.991 (11)
Sr1^{i}—Sr1—Te1^{vii}	118.976 (2)	Te1^{viii}—Sr1—Te1^{ix}	131.325 (12)
Sr1^{i}—Sr1—Te1^{vi}	118.976 (2)	Te1^{v}—Sr1—Te1^{iv}	76.427 (2)
Sr1^{ii}—Sr1—Te1^{x}	61.024 (2)	Te1^{viii}—Sr1—Te1^{iii}	76.427 (2)
Sr1^{ii}—Sr1—Te1^{vi}	61.024 (2)	Te1^{x}—Sr1—Te1^{iv}	150.542 (13)
Sr1^{i}—Sr1—Te1^{iii}	61.024 (2)	Te1^{v}—Sr1—Te1^{iii}	122.048 (5)
Sr1^{i}—Sr1—Te1^{viii}	61.024 (2)	Te1^{vi}—Sr1—Te1^{v}	131.325 (12)
Sr1^{i}—Sr1—Te1^{x}	118.976 (2)	Te1^{iv}—Sr1—Te1^{iii}	76.427 (2)
Sr1^{ii}—Sr1—Te1^{viii}	118.976 (2)	Te1^{viii}—Sr1—Te1^{v}	76.427 (2)
Sr1^{ii}—Sr1—Te1^{iv}	118.976 (2)	Te1^{vi}—Sr1—Te1^{vii}	76.427 (2)

Sr1^{i}—Sr1—Te1^{ix}	118.976 (2)	Te1^{ix}—Sr1—Te1^{vii}	122.048 (5)
Sr1^{ii}—Sr1—Te1^{vii}	61.024 (2)	Te1^{x}—Ga1—Te1^{xi}	100.532 (13)
Sr1^{ii}—Sr1—Te1^{ix}	61.024 (2)	Te1^{xi}—Ga1—Te1	114.117 (7)
Sr1^{ii}—Sr1—Te1^{iii}	118.976 (2)	Te1^{x}—Ga1—Te1	114.117 (7)
Sr1^{i}—Sr1—Te1^{v}	61.024 (2)	Te1^{x}—Ga1—Te1^{v}	114.117 (7)
Sr1^{i}—Sr1—Te1^{iv}	61.024 (2)	Te1^{xi}—Ga1—Te1^{v}	114.117 (7)
Te1^{vi}—Sr1—Te1^{x}	122.048 (5)	Te1^{v}—Ga1—Te1	100.532 (13)
Te1^{x}—Sr1—Te1^{vii}	76.427 (2)	Sr1^{xii}—Te1—Sr1^{vii}	57.952 (5)
Te1^{x}—Sr1—Te1^{iii}	131.325 (12)	Sr1^{v}—Te1—Sr1^{vii}	150.543 (13)
Te1^{viii}—Sr1—Te1^{x}	66.338 (7)	Sr1^{xii}—Te1—Sr1^{xiii}	150.543 (13)
Te1^{vi}—Sr1—Te1^{iii}	78.991 (11)	Sr1^{v}—Te1—Sr1^{xii}	113.662 (6)
Te1^{ix}—Sr1—Te1^{x}	76.427 (2)	Sr1^{v}—Te1—Sr1^{xiii}	57.952 (5)
Te1^{viii}—Sr1—Te1^{vii}	78.991 (11)	Sr1^{xiii}—Te1—Sr1^{vii}	113.662 (7)
Te1^{v}—Sr1—Te1^{x}	78.991 (11)	Ga1^{v}—Te1—Sr1^{xiii}	120.344 (7)
Te1^{ix}—Sr1—Te1^{v}	66.338 (6)	Ga1^{v}—Te1—Sr1^{vii}	120.344 (7)
Te1^{vii}—Sr1—Te1^{iii}	66.338 (6)	Ga1—Te1—Sr1^{xiii}	83.445 (4)
Te1^{ix}—Sr1—Te1^{iii}	150.542 (13)	Ga1—Te1—Sr1^{xii}	120.344 (7)
Te1^{vi}—Sr1—Te1^{ix}	76.427 (2)	Ga1^{v}—Te1—Sr1^{v}	83.445 (4)
Te1^{vi}—Sr1—Te1^{viii}	150.542 (13)	Ga1—Te1—Sr1^{v}	120.344 (7)
Te1^{vi}—Sr1—Te1^{iv}	66.338 (7)	Ga1—Te1—Sr1^{vii}	83.445 (4)
Te1^{v}—Sr1—Te1^{vii}	150.542 (13)	Ga1^{v}—Te1—Sr1^{xii}	83.445 (4)
Te1^{viii}—Sr1—Te1^{iv}	122.048 (5)	Ga1—Te1—Ga1^{v}	79.467 (13)

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