Supporting Information

Highly distorted HgS_4 tetrahedra induced moderate second-harmonic generation response of $EuHgGeS_4$

Mei Yan, [a] Zong-Dong Sun, [a] Wen-Dong Yao, [a] Wenfeng Zhou, [a] Wenlong Liu, [a]* and Sheng-Ping Guo[a]*

School of Chemistry and Chemical Engineering, Yangzhou University, Yangzhou, Jiangsu 225002, P. R. China

Table S1. Atomic coordinates ($\times 10^4$) and equivalent isotropic displacement parameters (U_{eq}[a], $Å^2 \times 10^3$) for **1**.

atom	*x*	*y*	*z*	U_{eq}/Å^2
Eu(1)	5000	5000	3218.4(13)	11.5(3)
Hg(1)	7500	3290.2(6)	8716.9(18)	45.5(4)
Ge(1)	7500	2158.1(15)	3365(3)	9.4(3)
S(1)	5791(3)	2276(3)	1271(5)	10.7(5)
S(2)	7500	4043(3)	5163(5)	8.7(7)
S(3)	7500	629(4)	5734(6)	13.2(8)

[a] U_{eq} is defined as one third of the trace of the orthogonalized U_{ij} tensor.

Table S2. Eu-based quaternary chalcogenides.

Compounds	Space group	Band gap (eV)	SHG intensity	Phase matchability	Reference
Cu_2EuSiS_4	$P3_121$	2.36	-	no	1
Cu_2EuGeS_4	$P3_221$	2.32	-	no	1
$Cu_2EuGeSe_4$	$Ama2$	1.74	-	no	1
$EuCdGeS_4$	$Ama2$	2.50	2.6 × AGS	yes	2
$EuCdGeSe_4$	$Ama2$	2.25	3.8 × AGS	yes	2
$EuZnGeS_4$	$Fdd2$	2.26	-	-	3
$Eu_2Ga_2GeS_7$	$P\bar{4}2_1m$	1.70	1.6 × AGS	yes	4
$EuCu_2GeS_4$	$P3_121$	1.57	-	-	5
$EuCu_2SnS_4$	$P3_121$	2.22	-	-	5

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