Electronic Supplementary Information

Table S1. Bond lengths (Å) and angles (_) of $K_2TbHf(PO_4)_3$ (Å, °)

K1—O1^{i}	2.965 (13)	K2—O4^{viii}	3.185 (17)
K1—O1^{ii}	2.965 (13)	K2—O4^{iv}	3.342 (17)
K1—O1^{iii}	2.965 (13)	K2—O4^{v}	3.342 (17)
K1—O2^{iv}	3.184 (16)	K2—O4	3.342 (17)
K1—O2^{v}	3.184 (16)	(Tb|Hf)1—O3^{ix}	2.143 (13)
K1—O2	3.184 (16)	(Tb|Hf)1—O3^{x}	2.143 (13)
K1—O4	3.308 (14)	(Tb|Hf)1—O3^{v}	2.143 (13)
K1—O4^{v}	3.308 (14)	(Tb|Hf)1—O4	2.154 (12)
K1—O4^{iv}	3.308 (14)	(Tb|Hf)1—O4^{viii}	2.154 (12)
K1—P1	3.570 (6)	(Tb|Hf)1—O4^{xi}	2.154 (12)
K1—P1^{v}	3.570 (6)	(Tb|Hf)2—O2^{iii}	2.103 (11)
K1—P1^{iv}	3.570 (6)	(Tb|Hf)2—O2^{xii}	2.103 (11)
K2—O3	2.953 (14)	(Tb|Hf)2—O2	2.103 (11)
K2—O3^{iv}	2.953 (14)	(Tb|Hf)2—O1^{xiii}	2.142 (12)
K2—O3^{v}	2.953 (14)	(Tb|Hf)2—O1^{xiv}	2.142 (11)
K2—O2^{vi}	3.099 (15)	(Tb|Hf)2—O1^{ii}	2.142 (12)
K2—O2^{vii}	3.099 (15)	P1—O4	1.497 (12)
K2—O2^{viii}	3.099 (15)	P1—O2	1.502 (12)
K2—O4^{vi}	3.185 (17)	P1—O1	1.504 (11)
K2—O4^{vii}	3.185 (17)	P1—O3	1.510 (12)
O3^{ix}—(Tb|Hf)1—O3^{x}	95.6 (5)	O2^{iii}—(Tb|Hf)2—O1x^{iii}	92.3 (5)
O3^{ix}—(Tb|Hf)1—O3^{v}	95.6 (5)	O2^{xii}—(Tb|Hf)2—O1^{xiii}	87.4 (5)
O3^{x}—(Tb|Hf)1—O3^{v}	95.6 (5)	O2—(Tb|Hf)2—O1^{xiii}	174.5 (5)
O3^{ix}—(Tb|Hf)1—O4	92.3 (6)	O2^{iii}—(Tb|Hf)2—O1^{xiv}	174.5 (5)
O3^{x}—(Tb|Hf)1—O4	172.1 (5)	O2^{xii}—(Tb|Hf)2—O1^{xiv}	92.3 (5)
O3^{v}—(Tb|Hf)1—O4	82.8 (5)	O2—(Tb|Hf)2—O1^{xiv}	87.4 (5)
O3^{ix}—(Tb|Hf)1—O4^{viii}	172.1 (5)	O1^{xiii}—(Tb|Hf)2—O1^{xiv}	93.1 (5)
O3^{x}—(Tb|Hf)1—O4^{viii}	82.8 (5)	O2^{iii}—(Tb|Hf)2—O1^{ii}	87.4 (5)
O3^{v}—(Tb|Hf)1—O4^{viii}	92.3 (6)	O2^{xii}—(Tb|Hf)2—O1^{ii}	174.5 (5)
O4—(Tb|Hf)1—O4^{viii}	89.5 (5)	O2—(Tb|Hf)2—O1^{ii}	92.3 (5)
O3^{ix}—(Tb|Hf)1—O4^{xi}	82.8 (5)	O1^{xiii}—(Tb|Hf)2—O1^{ii}	93.1 (5)
O3^{x}—(Tb|Hf)1—O4^{xi}	92.3 (6)	O1^{xiv}—(Tb|Hf)2—O1^{ii}	93.1 (5)
O3^{v}—(Tb|Hf)1—O4^{xi}	172.1 (5)	O4—P1—O2	107.0 (8)
O4—(Tb|Hf)1—O4^{xi}	89.5 (5)	O4—P1—O1	109.6 (8)
O4^{viii}—(Tb|Hf)1—O4^{xi}	89.5 (5)	O2—P1—O1	109.7 (8)
O2^{iii}—(Tb|Hf)2—O2^{xii}	87.1 (6)	O4—P1—O3	110.0 (8)
O2^{iii}—(Tb|Hf)2—O2	87.1 (6)	O2—P1—O3	109.9 (8)
O2^{xii}—(Tb|Hf)2—O2	87.1 (6)	O1—P1—O3	110.6 (8)

Symmetry codes: (i) −y+5/2, −z+1, x−1/2; (ii) x+1/2, −y+5/2, −z; (iii) −z+1, x+1/2, −y+3/2; (iv) y, z+1, x−1; (v) z+1,

x, y−1; (vi) −x+3/2, −y+2, z−1/2; (vii) −y+2, z+1/2, −x+1/2; (viii) z+1/2, −x+3/2, −y+1; (ix) −x+3/2, −y+2, z+1/2; (x) y−1/2, −z+1/2, −x+1; (xi) −y+3/2, −z+1, x−1/2; (xii) y−1/2, −z+3/2, −x+1; (xiii) z+1, x+1, y−1; (xiv) −y+2, z+3/2, −x+1/2.

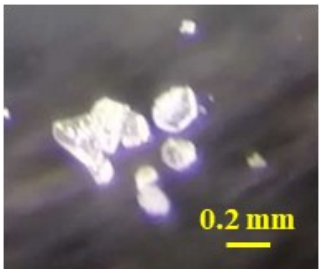

Fig. S1. The picture of the $K_2TbHf(PO_4)_3$ single crystals.

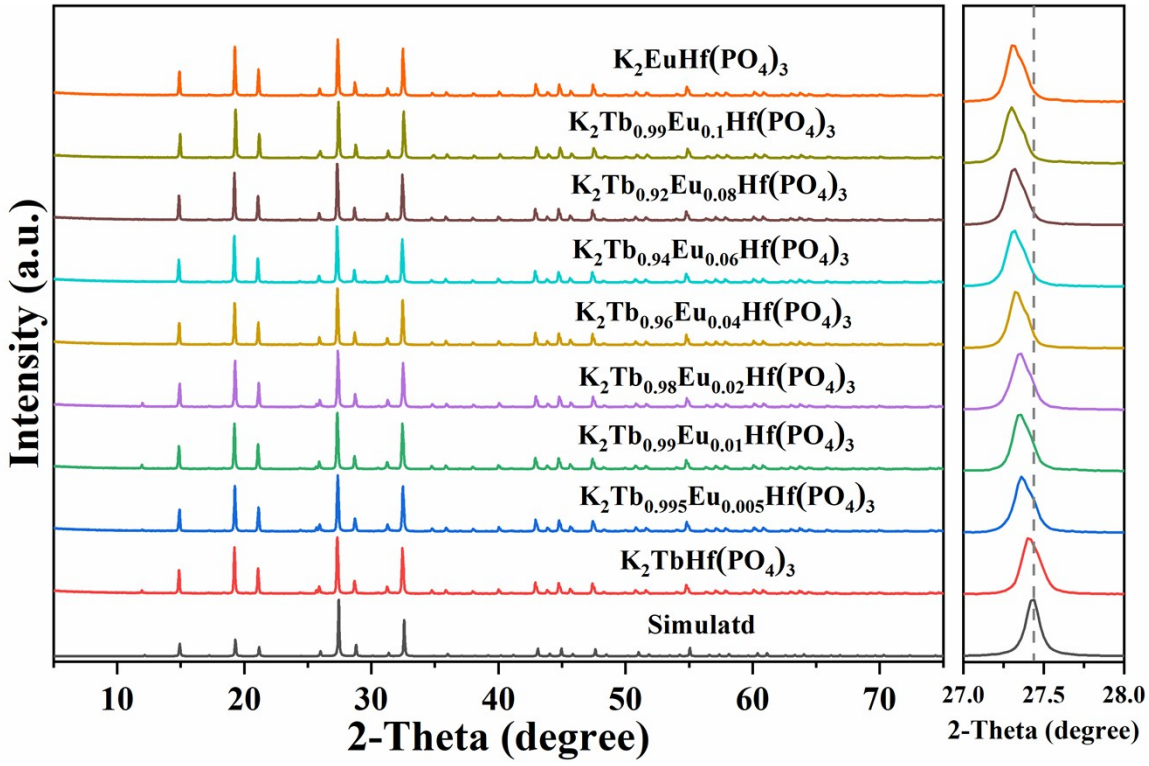

Fig. S2. XRD patterns of $K_2Tb_{1-x}Eu_xHf(PO_4)_3$ (x = 0, 0.005, 0.01, 0.02, 0.04, 0.06, 0.08, 0.1 and 1.0) phosphors.

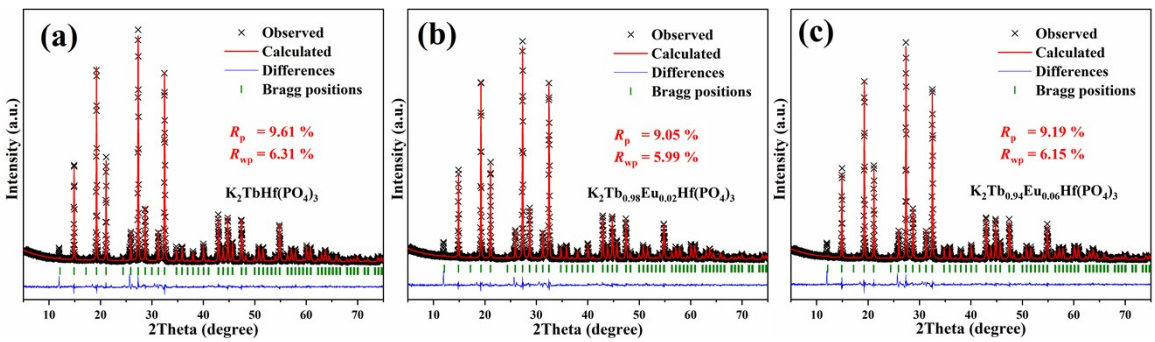

Fig. S3. Rietveld refinements of the XRD files for $K_2Tb_{1-x}Eu_xHf(PO_4)_3$ (x = 0, 0.02 and 0.06), respectively.

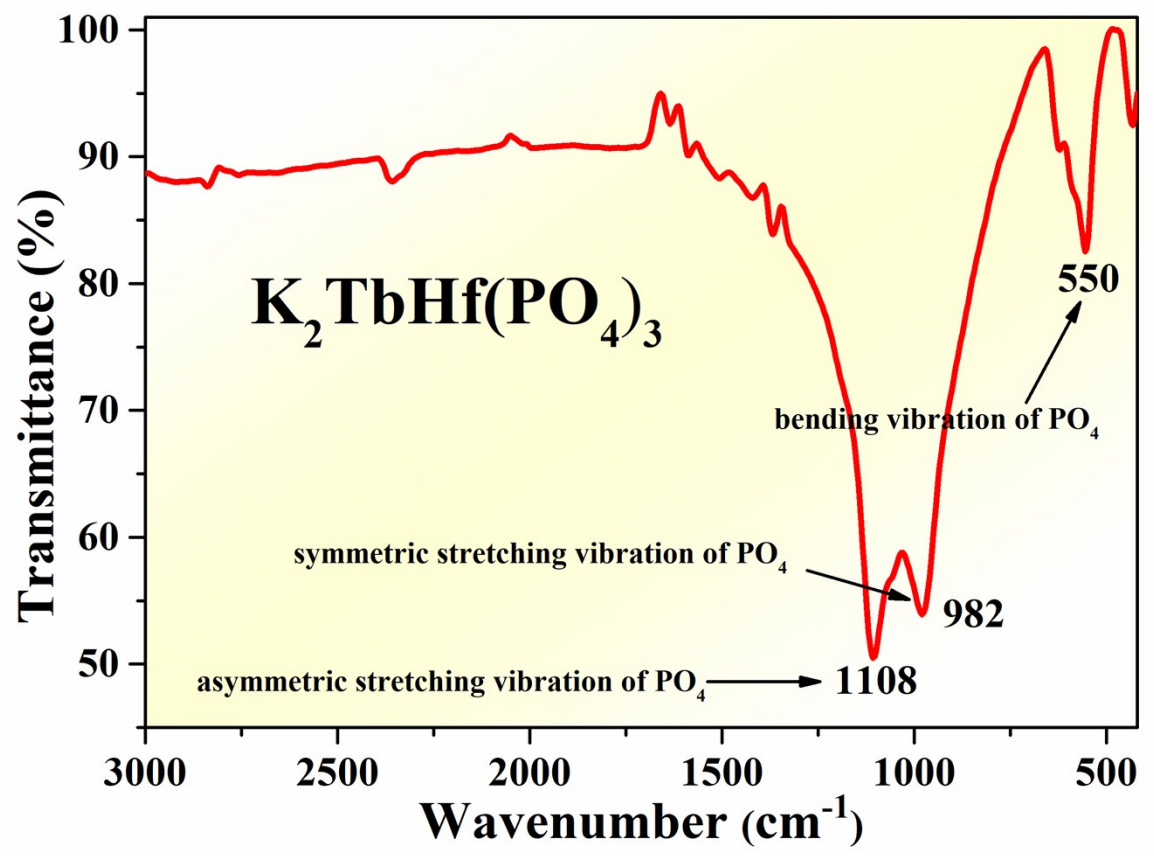

Fig. S4. The IR spectrum of $K_2TbHf(PO_4)_3$ in the range of 3000–420 cm^{-1}