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Supplementary information

Table S1a Atomic coordinates and isotropic displacement parameters for $Li_{3.5}Y_{1.5}(MoO_4)_4$ (x: 0.00) ($U_{eq} = (1/3)\Sigma_i\Sigma_j U_{ij} a_i^* a_j^* a_i \cdot a_j$).

Atom	Position	x/a	y/b	z/c	s.o.f.	U_{eq} / Å^2
Li1/Y1	2*i*	0.12128(9)	0.77267(7)	0.44014(4)	0.25/0.75	0.0109(2)
Mo1	2*i*	0.33632(6)	0.29999(5)	0.32035(3)		0.0119(1)
Mo2	2*i*	0.41737(7)	0.15377(6)	0.80009(3)		0.0135(2)
O1	2*i*	0.1154(6)	0.1162(5)	0.4072(3)		0.0156(5)
O2	2*i*	0.3013(6)	0.5639(5)	0.5714(3)		0.0178(5)
O3	2*i*	0.3567(7)	0.1754(5)	0.1622(3)		0.0209(6)
O4	2*i*	0.1984(6)	0.4994(5)	0.2944(3)		0.0174(5)
O5	2*i*	0.2703(7)	0.6860(6)	0.0691(3)		0.0252(6)
O6	2*i*	0.2268(7)	0.3241(5)	0.7720(3)		0.0206(6)
O7	2*i*	0.8008(7)	0.0584(5)	0.1382(3)		0.0207(6)
O8	2*i*	0.4850(6)	0.0419(5)	0.6409(3)		0.0170(5)
Li2	1*a*	0	0	0		0.053(4)
Li3	2*i*	0.839(3)	0.412(2)	0.121(2)		0.056(3)

Table S1b Atomic coordinates and isotropic displacement parameters for $Li_{3.5}(Y_{0.90}Eu_{0.10})_{1.5}(MoO_4)_4$ (x: 0.10) ($U_{eq} = (1/3)\Sigma_i\Sigma_j U_{ij} a_i^* a_j^* a_i \cdot a_j$).

Atom	Position	x/a	y/b	z/c	s.o.f.	U_{eq} / Å^2
Li1/Y1/Eu1	2*i*	0.12138(9)	0.77258(7)	0.44004(4)	0.25/0.675/0.075	0.0083(1)
Mo1	2*i*	0.33622(7)	0.29991(5)	0.32023(3)		0.0096(1)
Mo2	2*i*	0.41688(7)	0.15396(6)	0.80032(3)		0.0114(1)
O1	2*i*	0.1156(6)	0.1167(5)	0.4068(3)		0.0123(5)
O2	2*i*	0.3017(6)	0.5640(5)	0.5712(3)		0.0152(6)
O3	2*i*	0.3561(7)	0.1747(5)	0.1624(3)		0.0187(6)
O4	2*i*	0.1984(7)	0.4993(5)	0.2938(3)		0.0148(6)
O5	2*i*	0.2702(8)	0.6863(6)	0.0695(3)		0.0231(7)
O6	2*i*	0.2268(7)	0.3241(5)	0.7725(3)		0.0188(6)
O7	2*i*	0.8019(7)	0.0584(6)	0.1389(3)		0.0183(6)
O8	2*i*	0.4854(6)	0.0427(5)	0.6414(3)		0.0155(6)
Li2	1*a*	0	0	0		0.055(4)
Li3	2*i*	0.842(3)	0.405(2)	0.124(2)		0.050(3)

Table S1c Atomic coordinates and isotropic displacement parameters for $Li_{3.5}(Y_{0.75}Eu_{0.25})_{1.5}(MoO_4)_4$ (x: 0.25) ($U_{eq} = (1/3)\Sigma_i\Sigma_j U_{ij} a_i^* a_j^* a_i \cdot a_j$).

Atom	Position	*x/a*	*y/b*	*z/c*	s.o.f.	U_{eq} / Å^2
Li1/Y1/Eu1	2*i*	0.12066(7)	0.77234(5)	0.43995(3)	0.25/0.5625/0.1875	0.0099(1)
Mo1	2*i*	0.33560(6)	0.30000(5)	0.31983(3)		0.0111(1)
Mo2	2*i*	0.41767(7)	0.15410(5)	0.80083(3)		0.0127(1)
O1	2*i*	0.1164(5)	0.1171(4)	0.4065(3)		0.0143(5)
O2	2*i*	0.3033(6)	0.5643(4)	0.5717(3)		0.0174(5)
O3	2*i*	0.3569(6)	0.1756(5)	0.1618(3)		0.0199(5)
O4	2*i*	0.1962(6)	0.4984(4)	0.2936(3)		0.0168(5)
O5	2*i*	0.2686(7)	0.6866(5)	0.0686(3)		0.0249(6)
O6	2*i*	0.2287(6)	0.3251(5)	0.7733(3)		0.0205(6)
O7	2*i*	0.8011(6)	0.0575(5)	0.1378(3)		0.0198(5)
O8	2*i*	0.4859(6)	0.0435(4)	0.6420(3)		0.0166(5)
Li2	1*a*	0	0	0		0.059(4)
Li3	2*i*	0.841(3)	0.404(2)	0.125(2)		0.053(3)

Table S1d Atomic coordinates and isotropic displacement parameters for $Li_{3.5}(Y_{0.50}Eu_{0.50})_{1.5}(MoO_4)_4$ (*x*: 0.50) ($U_{eq} = (1/3)\Sigma_i\Sigma_j U_{ij}a_i^*a_j^*a_i \cdot a_j$).

Atom	Position	*x/a*	*y/b*	*z/c*	s.o.f.	U_{eq} / Å^2
Li1/Eu1/Y1	2*i*	0.12033(7)	0.77205(6)	0.43980(3)	0.25/0.375/0.375	0.0085(1)
Mo1	2*i*	0.33484(7)	0.29990(6)	0.31928(4)		0.0103(1)
Mo2	2*i*	0.41777(8)	0.15446(7)	0.80161(4)		0.0120(1)
O1	2*i*	0.1184(6)	0.1175(5)	0.4056(3)		0.0126(6)
O2	2*i*	0.3048(6)	0.5650(5)	0.5721(3)		0.0157(6)
O3	2*i*	0.3557(7)	0.1757(6)	0.1620(3)		0.0179(7)
O4	2*i*	0.1945(7)	0.4965(5)	0.2931(3)		0.0149(6)
O5	2*i*	0.2685(8)	0.6877(6)	0.0687(3)		0.0249(8)
O6	2*i*	0.2313(7)	0.3252(6)	0.7739(3)		0.0200(7)
O7	2*i*	0.8003(7)	0.0563(6)	0.1378(3)		0.0183(7)
O8	2*i*	0.4837(6)	0.0439(5)	0.6429(3)		0.0159(6)
Li2	1*a*	0	0	0		0.053(5)
Li3	2*i*	0.831(3)	0.397(3)	0.125(2)		0.061(4)

Table S1e Atomic coordinates and isotropic displacement parameters for $Li_{3.5}(Y_{0.25}Eu_{0.75})_{1.5}(MoO_4)_4$ (*x*: 0.75) ($U_{eq} = (1/3)\Sigma_i\Sigma_j U_{ij}a_i^*a_j^*a_i \cdot a_j$).

Atom	Position	*x/a*	*y/b*	*z/c*	s.o.f.	U_{eq} / Å^2
Li1/Y1/Eu1	2*i*	0.12001(6)	0.77183(5)	0.43964(3)	0.25/0.1875/0.5625	0.0094(1)
Mo1	2*i*	0.33420(7)	0.29986(5)	0.31873(3)		0.0106(1)
Mo2	2*i*	0.41808(8)	0.15474(6)	0.80227(3)		0.0123(1)
O1	2*i*	0.1196(6)	0.1175(5)	0.4049(3)		0.0129(6)
O2	2*i*	0.3063(7)	0.5643(5)	0.5725(3)		0.0158(6)
O3	2*i*	0.3562(7)	0.1753(6)	0.1615(3)		0.0192(6)
O4	2*i*	0.1922(7)	0.4953(5)	0.2921(3)		0.0166(6)
O5	2*i*	0.2683(8)	0.6894(6)	0.0691(3)		0.0241(7)
O6	2*i*	0.2320(7)	0.3259(5)	0.7752(3)		0.0193(6)
O7	2*i*	0.7997(7)	0.0556(6)	0.1368(3)		0.0194(6)
O8	2*i*	0.4826(7)	0.0445(5)	0.6429(3)		0.0159(6)
Li2	1*a*	0	0	0		0.064(5)
Li3	2*i*	0.839(3)	0.403(2)	0.124(2)		0.053(3)

Table S1f Atomic coordinates and isotropic displacement parameters for $Li_{3.5}Eu_{1.5}(MoO_4)_4$ (*x*: 1.00) ($U_{eq} = (1/3)\Sigma_i\Sigma_j U_{ij}a_i^*a_j^*a_i \cdot a_j$).

Atom	Position	*x/a*	*y/b*	*z/c*	s.o.f.	U_{eq} / Å^2
Li1/Eu1	2*i*	0.11989(4)	0.77156(4)	0.43946(2)	0.25/0.75	0.0095(1)
Mo1	2*i*	0.33392(6)	0.29982(5)	0.31824(3)		0.0104(1)
Mo2	2*i*	0.41798(7)	0.15515(6)	0.80287(3)		0.0121(1)
O1	2*i*	0.1204(5)	0.1170(5)	0.4046(3)		0.0135(5)
O2	2*i*	0.3074(5)	0.5645(5)	0.5730(3)		0.0170(6)
O3	2*i*	0.3555(6)	0.1745(5)	0.1615(3)		0.0196(6)
O4	2*i*	0.1912(6)	0.4943(5)	0.2915(3)		0.0161(6)
O5	2*i*	0.2689(6)	0.6893(6)	0.0687(3)		0.0231(7)
O6	2*i*	0.2333(6)	0.3266(5)	0.7764(3)		0.0188(6)
O7	2*i*	0.7991(6)	0.0555(5)	0.1366(3)		0.0193(6)
O8	2*i*	0.4810(5)	0.0453(5)	0.6435(3)		0.0159(6)
Li2	1*a*	0	0	0		0.045(3)
Li3	2*i*	0.829(3)	0.403(3)	0.120(2)		0.063(3)

Table S2a Anisotropic displacement parameters of $Li_{3.5}Y_{1.5}(MoO_4)_4$ (*x*: 0.00).

Atom	U_{11}	U_{22}	U_{33}	U_{12}	U_{13}	U_{23}
Li1/Y1	0.0106(3)	0.0122(3)	0.0110(3)	0.0056(2)	0.0037(2)	0.0033(2)
Mo1	0.01103(19)	0.0139(2)	0.01217(19)	0.00595(14)	0.00398(13)	0.00431(14)
Mo2	0.0142(2)	0.0175(2)	0.01087(19)	0.00847(14)	0.00439(12)	0.00308(13)
O1	0.0183(13)	0.0149(12)	0.0166(12)	0.0090(11)	0.0068(10)	0.0046(10)
O2	0.0154(13)	0.0182(13)	0.0197(13)	0.0072(11)	0.0035(11)	0.0054(11)
O3	0.0185(14)	0.0248(15)	0.0190(13)	0.0112(12)	0.0045(11)	0.0008(11)
O4	0.0214(14)	0.0183(13)	0.0173(12)	0.0126(12)	0.0064(11)	0.0051(11)
O5	0.0226(16)	0.0293(17)	0.0178(13)	0.0061(13)	0.0019(12)	0.0062(12)
O6	0.0220(15)	0.0199(14)	0.0237(13)	0.0120(12)	0.0073(12)	0.0066(12)
O7	0.0231(15)	0.0246(15)	0.0201(13)	0.0129(13)	0.0095(11)	0.0092(12)
O8	0.0171(13)	0.0176(13)	0.0168(12)	0.0076(11)	0.0076(10)	0.0019(10)

Table S2b Anisotropic displacement parameters of $Li_{3.5}(Y_{0.90}Eu_{0.10})_{1.5}(MoO_4)_4$ (*x*: 0.10).

Atom	U_{11}	U_{22}	U_{33}	U_{12}	U_{13}	U_{23}
Li1/Y1/Eu1	0.0088(2)	0.0071(2)	0.0097(2)	0.00359(17)	0.00319(15)	0.00211(16)
Mo1	0.00886(18)	0.00936(18)	0.01106(18)	0.00365(13)	0.00355(12)	0.00359(12)
Mo2	0.01222(19)	0.01321(19)	0.00962(18)	0.00631(14)	0.00366(12)	0.00235(12)
O1	0.0120(13)	0.0115(13)	0.0140(12)	0.0047(11)	0.005(1)	0.0039(10)
O2	0.0138(14)	0.0126(13)	0.0168(13)	0.0032(11)	0.0038(11)	0.0037(11)
O3	0.0163(14)	0.0204(15)	0.0183(14)	0.0089(12)	0.0044(11)	-0.0006(11)
O4	0.0204(15)	0.0120(13)	0.0159(13)	0.0097(12)	0.0080(11)	0.0032(10)
O5	0.0228(17)	0.0246(17)	0.0132(14)	0.0042(14)	-0.0002(12)	0.0022(12)
O6	0.0217(16)	0.0158(14)	0.0210(15)	0.0106(13)	0.0073(12)	0.0023(12)
O7	0.0178(15)	0.0213(15)	0.0204(14)	0.0101(13)	0.0085(11)	0.0092(12)
O8	0.0148(14)	0.0135(13)	0.0167(13)	0.0046(11)	0.0068(11)	0.0012(11)

Table S2c Anisotropic displacement parameters of $Li_{3.5}(Y_{0.75}Eu_{0.25})_{1.5}(MoO_4)_4$ (*x*: 0.25).

Atom	U_{11}	U_{22}	U_{33}	U_{12}	U_{13}	U_{23}
Li1/Y1/Eu1	0.0111(2)	0.0101(2)	0.0102(2)	0.00552(16)	0.00327(15)	0.00362(16)
Mo1	0.01137(18)	0.01234(19)	0.01146(19)	0.00587(13)	0.00377(12)	0.00499(13)
Mo2	0.01446(19)	0.01572(19)	0.00996(18)	0.00821(13)	0.00377(12)	0.00361(12)
O1	0.0166(12)	0.0145(11)	0.0146(12)	0.0094(10)	0.0042(9)	0.0044(9)
O2	0.0160(13)	0.0173(12)	0.0171(13)	0.0055(10)	0.0028(10)	0.0052(10)
O3	0.0187(13)	0.0237(13)	0.0167(13)	0.0108(11)	0.0038(10)	0.0008(10)
O4	0.0208(13)	0.0164(11)	0.0173(13)	0.0111(10)	0.0064(10)	0.0051(9)
O5	0.0243(15)	0.0260(14)	0.0161(14)	0.0039(12)	0.0018(11)	0.0038(11)
O6	0.0233(14)	0.0193(12)	0.0230(14)	0.0123(11)	0.0084(11)	0.0058(11)
O7	0.0215(14)	0.0249(13)	0.0192(13)	0.0132(11)	0.0091(11)	0.0095(11)
O8	0.0154(12)	0.0174(11)	0.0166(12)	0.0057(10)	0.0071(10)	0.0035(10)

Table S2d Anisotropic displacement parameters of $Li_{3.5}(Y_{0.50}Eu_{0.50})_{1.5}(MoO_4)_4$ (*x*: 0.50).

Atom	U_{11}	U_{22}	U_{33}	U_{12}	U_{13}	U_{23}
Li1/Y1/Eu1	0.00842(19)	0.0074(2)	0.0088(2)	0.00290(15)	0.00219(14)	0.00092(15)
Mo1	0.00935(19)	0.0106(2)	0.0105(2)	0.00381(15)	0.00283(14)	0.00272(15)
Mo2	0.0124(2)	0.0142(2)	0.00903(19)	0.00601(15)	0.00306(14)	0.00147(14)
O1	0.0123(13)	0.0089(14)	0.0174(15)	0.0040(12)	0.0060(11)	0.0044(12)
O2	0.0129(14)	0.0148(16)	0.0153(14)	0.0024(12)	0.0022(11)	0.0030(12)
O3	0.0164(14)	0.0223(17)	0.0140(15)	0.0096(13)	0.0044(12)	-0.0013(13)
O4	0.0186(14)	0.0114(14)	0.0151(14)	0.0073(12)	0.0041(12)	0.0021(12)
O5	0.0234(16)	0.0257(19)	0.0155(16)	0.0019(15)	0.0015(13)	0.0040(14)
O6	0.0211(16)	0.0192(17)	0.0218(17)	0.0120(14)	0.0060(13)	0.0025(14)
O7	0.0167(15)	0.0224(18)	0.0181(15)	0.0078(13)	0.0078(12)	0.0083(14)
O8	0.0150(14)	0.0140(15)	0.0173(15)	0.0047(13)	0.0060(12)	0.0021(12)

Table S2e Anisotropic displacement parameters of $Li_{3.5}(Y_{0.25}Eu_{0.75})_{1.5}(MoO_4)_4$ (*x*: 0.75).

Atom	U_{11}	U_{22}	U_{33}	U_{12}	U_{13}	U_{23}
Li1/Y1/Eu1	0.01071(17)	0.00821(16)	0.00922(15)	0.00370(12)	0.00345(11)	0.00214(11)
Mo1	0.01118(19)	0.01089(19)	0.01052(17)	0.00443(15)	0.00403(13)	0.00367(13)
Mo2	0.01411(19)	0.01454(19)	0.00907(16)	0.00657(15)	0.00402(13)	0.00254(12)
O1	0.0133(13)	0.0119(14)	0.0158(12)	0.0056(11)	0.0067(11)	0.0052(10)
O2	0.0155(15)	0.0130(14)	0.0162(13)	0.0030(12)	0.0039(11)	0.0044(11)
O3	0.0170(15)	0.0227(17)	0.0162(13)	0.0093(14)	0.0036(11)	-0.0002(12)
O4	0.0197(15)	0.0152(14)	0.0155(13)	0.0084(13)	0.0042(11)	0.0041(11)
O5	0.0221(17)	0.0264(18)	0.0142(13)	0.0028(15)	0.0016(12)	0.0023(12)
O6	0.0218(16)	0.0168(16)	0.0205(14)	0.0095(14)	0.0065(12)	0.0036(12)
O7	0.0207(16)	0.0252(17)	0.0180(13)	0.0116(14)	0.0095(12)	0.0102(12)
O8	0.0154(15)	0.0156(15)	0.0150(13)	0.0038(12)	0.0067(11)	0.0030(11)

Table S2f Anisotropic displacement parameters of $Li_{3.5}(Eu_{1.5}(MoO_4)_4$ (*x*: 1.00).

Atom	U_{11}	U_{22}	U_{33}	U_{12}	U_{13}	U_{23}
Eu1/Eu1	0.00999(13)	0.00818(14)	0.01075(14)	0.00354(10)	0.00375(10)	0.0028(1)
Mo1	0.01014(16)	0.01072(19)	0.01162(17)	0.00447(13)	0.00437(13)	0.00458(14)
Mo2	0.01302(16)	0.01416(19)	0.01011(17)	0.00632(13)	0.00420(12)	0.00321(13)
O1	0.0135(10)	0.0109(13)	0.0183(13)	0.0053(10)	0.0076(10)	0.0052(11)
O2	0.0157(11)	0.0155(15)	0.0177(14)	0.0036(10)	0.0042(10)	0.0063(11)
O3	0.0173(12)	0.0234(16)	0.0184(14)	0.0102(12)	0.0064(10)	0.0007(12)
O4	0.0210(12)	0.0146(14)	0.0170(14)	0.0103(11)	0.0072(10)	0.0062(11)
O5	0.0224(13)	0.0247(17)	0.0157(14)	0.0043(12)	0.0022(11)	0.0054(13)
O6	0.0206(13)	0.0184(16)	0.0198(15)	0.0110(11)	0.0056(11)	0.0047(12)
O7	0.0200(13)	0.0234(16)	0.0206(14)	0.0112(12)	0.0102(11)	0.0107(13)
O8	0.0135(11)	0.0156(14)	0.0179(14)	0.0043(10)	0.0071(10)	0.0041(11)

Table S3a Interatomic distances in $Li_{3.5}(Y_{1-x}Eu_x)_{1.5}(MoO_4)_4$ (x: 0.00, 0.10, 0.25, 0.50, 0.75, 1.00) in the [M1O$_8$]-polyhera (M1: 75% ($Y1_{1-x}Eu1_x$) + 25% Li1) in Å.

***d*(*M*1,O*x*)**	**Sym. O*x***	***x*: 0.00**	***x*: 0.10**	***x*: 0.25**	***x*: 0.50**	***x*: 0.75**	***x*: 1.00**
d(*M*1,O1)	*x*, 1+*y*, *z*	2.374(3)	2.382(3)	2.389(2)	2.400(3)	2.407(3)	2.417(3)
d(*M*1,O1)	-*x*, 1-*y*, 1-*z*	2.338(3)	2.345(3)	2.350(2)	2.370(3)	2.384(3)	2.395(3)
d(*M*1,O2)	*x*, *y*, *z*	2.405(3)	2.407(3)	2.417(3)	2.425(3)	2.441(3)	2.452(3)
d(*M*1,O2)	-*x*, 1-*y*, 1-*z*	2.442(3)	2.449(3)	2.454(3)	2.467(3)	2.473(3)	2.482(3)
d(*M*1,O4)	*x*, *y*, *z*	2.345(3)	2.350(3)	2.352(2)	2.364(3)	2.373(3)	2.383(3)
d(*M*1,O6)	-*x*, 1-*y*, 1-*z*	2.380(3)	2.385(3)	2.393(3)	2.405(3)	2.417(3)	2.430(3)
d(*M*1,O8)	*x*, 1+*y*, *z*	2.411(3)	2.419(3)	2.429(3)	2.438(3)	2.442(3)	2.453(3)
d(*M*1,O8)	1-*x*, 1-*y*, 1-*z*	2.338(3)	2.341(3)	2.347(3)	2.367(3)	2.376(3)	2.391(3)

Table S3b Interatomic distances in $Li_{3.5}(Y_{1-x}Eu_x)_{1.5}(MoO_4)_4$ (x: 0.00, 0.10, 0.25, 0.50, 0.75, 1.00) in the [Mo1O$_4$]-tetrahedra in Å.

***d*(Mo1,O*x*)**	**Sym. O*x***	***x*: 0.00**	***x*: 0.10**	***x*: 0.25**	***x*: 0.50**	***x*: 0.75**	***x*: 1.00**
d(Mo1,O1)	*x*, *y*, *z*	1.816(3)	1.814(3)	1.813(3)	1.807(3)	1.806(3)	1.811(3)
d(Mo1,O2)	1-*x*, 1-*y*, 1-*z*	1.795(3)	1.797(3)	1.794(3)	1.795(3)	1.794(3)	1.792(3)
d(Mo1,O3)	*x*, *y*, *z*	1.729(3)	1.729(3)	1.733(3)	1.728(3)	1.733(3)	1.730(3)
d(Mo1,O4)	*x*, *y*, *z*	1.760(3)	1.764(3)	1.765(2)	1.762(3)	1.766(3)	1.769(3)

Table S3c Interatomic distances in $Li_{3.5}(Y_{1-x}Eu_x)_{1.5}(MoO_4)_4$ (x: 0.00, 0.10, 0.25, 0.50, 0.75, 1.00) in the [Mo2O$_4$]-tetrahedra in Å.

d(Mo2,O*x*)	Sym. O*x*	*x*: 0.00	*x*: 0.10	*x*: 0.25	*x*: 0.50	*x*: 0.75	*x*: 1.00
d(Mo2,O5)	1-*x*, 1-*y*, 1-*z*	1.732(3)	1.732(3)	1.737(3)	1.733(4)	1.728(3)	1.724(3)
d(Mo2,O6)	*x*, *y*, *z*	1.785(3)	1.784(3)	1.787(3)	1.781(3)	1.784(3)	1.784(3)
d(Mo2,O7)	1-*x*, -*y*, 1-*z*	1.744(3)	1.744(3)	1.747(3)	1.743(3)	1.747(3)	1.749(3)
d(Mo2,O8)	*x*, *y*, *z*	1.823(3)	1.823(3)	1.822(3)	1.818(3)	1.822(3)	1.818(3)

Table S3d Interatomic distances in $Li_{3.5}(Y_{1-x}Eu_x)_{1.5}(MoO_4)_4$ (x: 0.00, 0.10, 0.25, 0.50, 0.75, 1.00) in the [Li2O$_4$]-polyhedra in Å.

d(Li2,O*x*)	Sym. O*x*	*x*: 0.00	*x*: 0.10	*x*: 0.25	*x*: 0.50	*x*: 0.75	*x*: 1.00
d(Li2,O3)	*x*, *y*, *z*	2.042(3)	2.043(3)	2.043(3)	2.044(3)	2.044(3)	2.046(3)
d(Li2,O3)	-*x*, -*y*, -*z*	2.042(3)	2.043(3)	2.043(3)	2.044(3)	2.044(3)	2.046(3)
d(Li2,O7)	1-*x*, -*y*, -*z*	1.966(3)	1.969(3)	1.963(3)	1.969(3)	1.965(3)	1.970(3)
d(Li2,O7)	-1+*x*, *y*, *z*	1.966(3)	1.969(3)	1.963(3)	1.969(3)	1.965(3)	1.970(3)
d(Li2,O5)	*x*, -1+*y*, *z*	3.027(5)	3.031(5)	3.025(4)	3.026(5)	3.023(5)	3.034(5)
d(Li2,O5)	-*x*, 1-*y*, -*z*	3.027(5)	3.031(5)	3.025(4)	3.026(5)	3.023(5)	3.034(5)

Table S3e Interatomic distances in $Li_{3.5}(Y_{1-x}Eu_x)_{1.5}(MoO_4)_4$ (x: 0.00, 0.10, 0.25, 0.50, 0.75, 1.00) in the [Li3O$_6$]-octahedra in Å.

***d*(Li3,O*x*)**	**Sym. O*x***	***x*: 0.00**	***x*: 0.10**	***x*: 0.25**	***x*: 0.50**	***x*: 0.75**	***x*: 1.00**
d(Li3,O3)	*x*, *y*, *z*	2.566(15)	2.557(14)	2.548(13)	2.506(16)	2.555(15)	2.606(16)
d(Li3,O4)	*1*+*x*, *y*, *z*	2.151(15)	2.112(14)	2.102(14)	2.127(17)	2.104(14)	2.085(17)
d(Li3,O5)	*1*+*x*, *y*, *z*	2.513(15)	2.544(14)	2.555(14)	2.622(16)	2.580(15)	2.543(16)
d(Li3,O5)	*1*-*x*, 1-*y*, -*z*	1.855(15)	1.892(14)	1.890(15)	1.889(18)	1.884(14)	1.894(17)
d(Li3,O6)	*1*-*x*, 1-*y*, 1-*z*	2.077(15)	2.105(14)	2.108(13)	2.131(17)	2.122(15)	2.079(16)
d(Li3,O7)	*x*, *y*, *z*	2.319(15)	2.273(14)	2.271(13)	2.252(17)	2.293(14)	2.365(15)

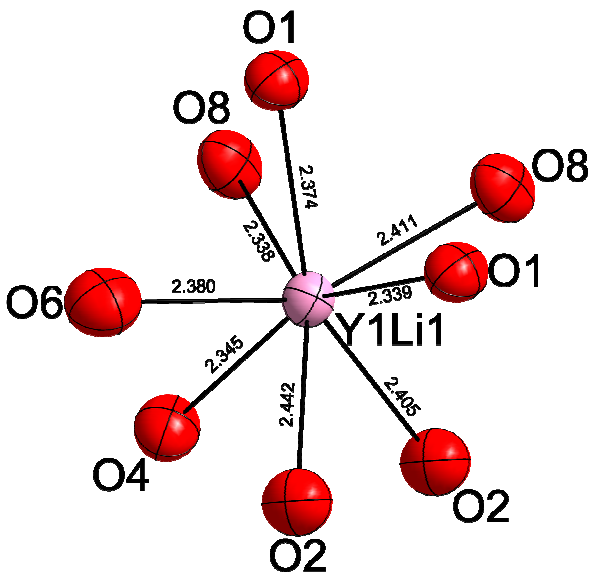

Fig. S1 ORTEP style representation of *M*1O_8-coordination polyhedra (*M*1: 75%Y + 25%Li) in $Li_{3.5}Y_{1.5}(MoO_4)_4$. Ellipsoids at 90% probability level.

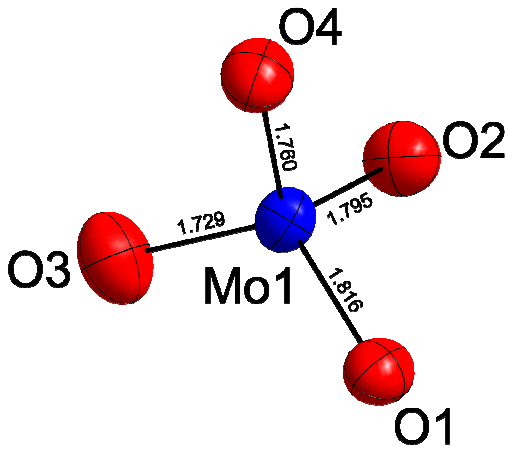

Fig. S2 ORTEP style representation of Mo1O_4-coordination polyhedra in $Li_{3.5}Y_{1.5}(MoO_4)_4$. Ellipsoids at 90% probability level.

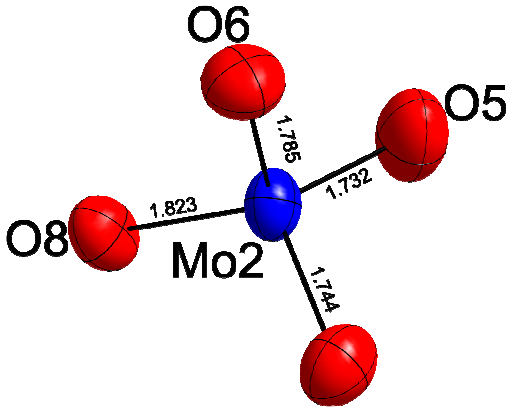

Fig. S3 ORTEP style representation of Mo2O_4-coordination polyhedra in $Li_{3.5}Y_{1.5}(MoO_4)_4$. Ellipsoids at 90% probability level.

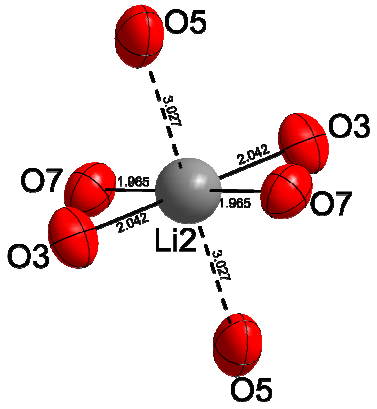

Fig. S4 ORTEP style representation of Li2O_4-coordination polyhedra in $Li_{3.5}Y_{1.5}(MoO_4)_4$. Ellipsoids at 90% probability level.

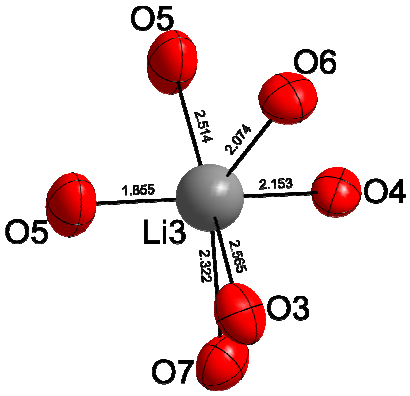

Fig. S5 ORTEP style representation of Li3O_4-coordination polyhedra in $Li_{3.5}Y_{1.5}(MoO_4)_4$. Ellipsoids at 90% probability level.