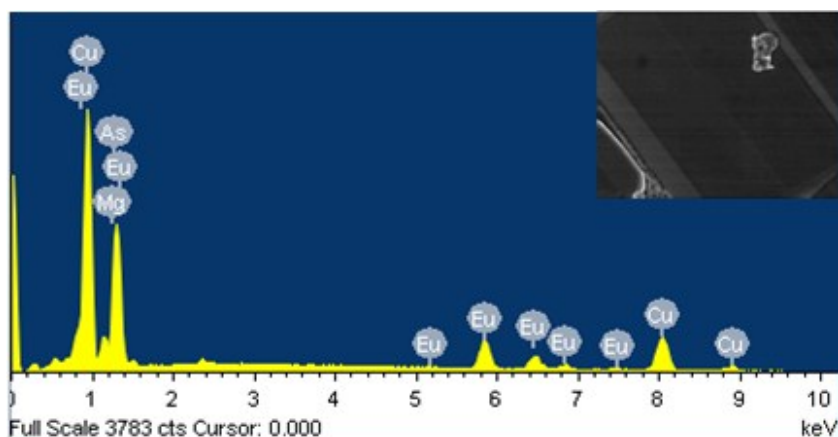


Supporting Information

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1. EDX analysis on the single crystals of $\text{Eu}_5\text{Mg}_{2.39}\text{Cu}_{16.61}\text{As}_{12}$.



Sample 1

Element	Weight%	Atomic%	Composition
Mg K	2.76	8.58	3.02
Cu L	38.72	46.12	16.27
As L	31.54	31.86	11.24
Eu L	26.99	13.44	4.74

Sample 2

Element	Weight%	Atomic%	Composition
Mg K	2.50	7.72	2.72
Cu L	40.17	47.37	16.71
As L	32.85	32.85	11.59
Eu L	24.48	12.07	4.26

Sample 3

Element	Weight%	Atomic%	Composition
Mg K	2.45	7.54	2.65
Cu L	39.19	46.86	16.53
As L	31.36	31.52	11.12
Eu L	26.59	13.68	4.82

Averaged Composition: $\text{Eu}_{4.61}\text{Mg}_{2.79}\text{Cu}_{16.50}\text{As}_{11.32}$

Table S1. Refined atomic coordinates and isotropic displacement parameters of $\text{Sr}_2\text{Mg}_3\text{Cu}_9\text{P}_7$, $\text{Sr}_2\text{Mg}_3\text{Cu}_9\text{As}_7$ and $\text{Eu}_2\text{Mg}_3\text{Cu}_9\text{P}_7$.

Atoms	Wyckoff	x	y	z	U_{eq} (\AA^2)
$\text{Sr}_2\text{Mg}_3\text{Cu}_9\text{P}_7$					
Sr1	<i>1f</i>	2/3	1/3	0.5000	0.0095(7)
Sr2	<i>1c</i>	1/3	2/3	0.0000	0.0090(8)
Mg	<i>3k</i>	0.2253(7)	0.1163(7)	0.5000	0.0118(15)
Cu1	<i>3k</i>	0.0505(3)	0.4339(3)	0.5000	0.0132(6)
Cu2	<i>3j</i>	0.1262(3)	0.2835(3)	0.0000	0.0129(5)
Cu3	<i>3j</i>	0.4247(3)	0.3685(3)	0.0000	0.0146(6)
P1	<i>3k</i>	0.2928(6)	0.4077(6)	0.5000	0.0071(11)
P2	<i>3j</i>	0.4147(6)	0.1065(6)	0.0000	0.0095(12)
P3	<i>1a</i>	0.0000	0.0000	0.0000	0.0121(18)
$\text{Sr}_2\text{Mg}_3\text{Cu}_9\text{As}_7$					
Sr1	<i>1f</i>	2/3	1/3	0.5000	0.0091(4)
Sr2	<i>1c</i>	1/3	2/3	0.0000	0.0084(4)
Mg	<i>3k</i>	0.2244(5)	0.1103(5)	0.5000	0.0137(9)
Cu1	<i>3k</i>	0.37715(18)	0.43060(18)	0.5000	0.0134(4)
Cu2	<i>3j</i>	0.15738(16)	0.28495(16)	0.0000	0.0123(3)
Cu3	<i>3j</i>	0.4216(2)	0.0574(2)	0.0000	0.0146(4)
As1	<i>3k</i>	0.11324(14)	0.40937(14)	0.5000	0.0092(3)
As2	<i>3j</i>	0.41745(14)	0.30899(13)	0.0000	0.0072(3)
As3	<i>1a</i>	0.0000	0.0000	0.0000	0.0076(4)
$\text{Eu}_2\text{Mg}_3\text{Cu}_9\text{P}_7$					
Eu1	<i>1f</i>	2/3	1/3	0.5000	0.0088(2)
Eu2	<i>1c</i>	1/3	2/3	0.0000	0.0078(3)
Mg	<i>3k</i>	0.2252(5)	0.1064(5)	0.5000	0.0093(10)
Cu1	<i>3k</i>	0.3856(2)	0.4341(2)	0.5000	0.0111(4)
Cu2	<i>3j</i>	0.15941(18)	0.28417(18)	0.0000	0.0107(3)
Cu3	<i>3j</i>	0.4246(2)	0.0550(2)	0.0000	0.0118(4)
P1	<i>3k</i>	0.1185(5)	0.4102(5)	0.5000	0.0080(7)
P2	<i>3j</i>	0.4183(4)	0.3048(4)	0.0000	0.0065(7)
P3	<i>1a</i>	0.0000	0.0000	0.0000	0.0070(9)

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

Figure S1. Powder X-ray diffraction patterns of $\text{Eu}_2\text{Mg}_3\text{Cu}_9\text{As}_7$ recorded at room temperature. The simulated patterns are provided for comparison as well.

