

Supplementary Materials:

Table S1. Standard thermodynamic properties (ΔG°) of monazite and xenotime at 25 °C and 1 bar, derived from calorimetric measurements. Other thermodynamic data (e.g., ΔH°_f , S° , V°_m) were reviewed by Pan et al. [13].

Monazite	ΔG°_f (kJ mol ⁻¹)	Xenotime	ΔG°_f (kJ mol ⁻¹)
LaPO ₄	-1850.5 ^[17]	YPO ₄	-1867.9 ± 1.7 ^[54]
	-1861.2 ^[18]		-1849.8 ^[11]
	-1850.5 ± 1.9 ^[15]	DyPO ₄	-1829.1 ^[11]
CePO ₄	-1847.53 ^[10]	HoPO ₄	-1851.6 ± 3.4 ^[59]
	-1849.8 ^[17]		-1855.4 ± 2.1 ^[20]
	-1849.9 ± 2.3 ^[15]		-1832.5 ^[11]
PrPO ₄	-1850.5 ^[17]	TmPO ₄	-1844 ^[58]
	-1855.6 ^[18]	YbPO ₄	-1809.8 ± 4.9 ^[55]
	-1841.9 ± 3.3 ^[15]		-1808.4 ^[11]
NdPO ₄	-1851.8 ± 4.7 ^[51]	LuPO ₄	-1835.4 ± 4.2 ^[53]
	-1849.6 ^[17]		
	-1846.2 ^[18]		
SmPO ₄	-1848.4 ± 2.6 ^[15]		
	-1839.5 ^[57]		
	-1846.9 ^[17]		
EuPO ₄	-1747.8 ± 2.8 ^[52]		
	-1746 ^[18]		
	-1741.6 ^[17]		
GdPO ₄	-1741.6 ± 2.8 ^[15]		
	-1844.47 ^[10]		
	-1840.8 ^[17]		
	-1840.8 ± 2.3 ^[15]		
	-1844.3 ± 4.7 ^[56]		