

Supplementary Materials

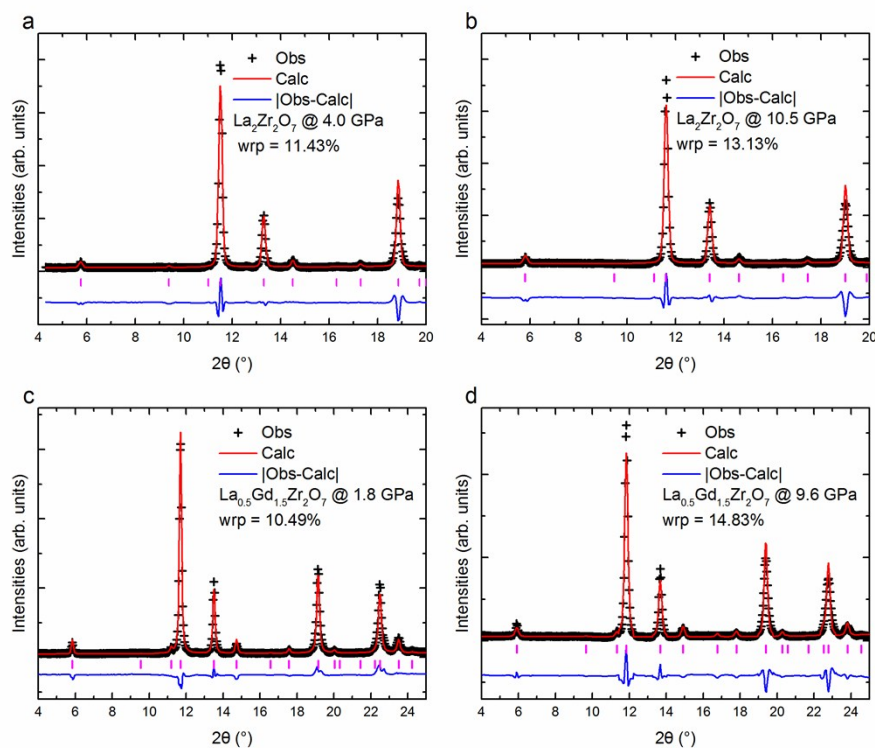


Fig. S1. Le Bail refinements results of a)  $\text{La}_2\text{Zr}_2\text{O}_7$  at 4.0 GPa. b)  $\text{La}_2\text{Zr}_2\text{O}_7$  at 10.5 GPa. c)  $\text{La}_{0.5}\text{Gd}_{1.5}\text{Zr}_2\text{O}_7$  at 1.8 GPa and d)  $\text{La}_{0.5}\text{Gd}_{1.5}\text{Zr}_2\text{O}_7$  at 9.6 GPa. Black cross are the data observed from XRD pattern and red lines are the calculated XRD pattern curves. Blue lines are the differences between the observation and the calculations. Magenta bars mark the  $2\theta$  of the calculated reflections.

Table s1. The a-axial lengths and unit-cell volumes of  $\text{La}_2\text{Zr}_2\text{O}_7$  and  $\text{La}_{0.5}\text{Gd}_{1.5}\text{Zr}_2\text{O}_7$  under pressures.

$\text{La}_2\text{Zr}_2\text{O}_7$			$\text{La}_{0.5}\text{Gd}_{1.5}\text{Zr}_2\text{O}_7$		
$P$ (GPa)	$a$ (Å)	$V$ (Å <sup>3</sup> )	$P$ (GPa)	$a$ (Å)	$V$ (Å <sup>3</sup> )
0.0001	10.788(1)	1255.4(1)	0.1	10.5786(3)	1183.8(1)
0.6	10.7747(5)	1250.9(2)	1.8	10.5428(5)	1171.8(2)
2.3	10.7375(6)	1238.0(2)	3.6	10.4892(6)	1154.1(2)
3.9	10.7094(6)	1228.3(2)	5.0	10.4661(5)	1146.5(2)
5.6	10.6770(6)	1217.2(2)	7.4	10.4332(7)	1135.7(2)
7.1	10.6550(6)	1209.7(2)	9.6	10.4111(7)	1128.5(2)
8.7	10.6331(6)	1202.2(2)	13.2	10.3768(7)	1117.4(2)
10.5	10.6131(7)	1195.4(2)	14.7	10.3668(7)	1114.1(2)
12.4	10.5893(6)	1187.4(2)	16.1	10.3585(8)	1111.4(2)
14.0	10.5724(7)	1181.7(2)	17.9	10.3432(7)	1106.5(2)
15.5	10.5482(8)	1173.6(3)	20.1	10.3223(8)	1099.8(3)
17.1	10.5327(8)	1168.5(3)	21.7	10.3081(9)	1095.3(3)
19.0	10.5072(8)	1160.0(3)			
20.8	10.4865(7)	1153.2(2)			
22.8	10.4580(9)	1143.8(3)			