Table S1. Anisotropic displacement parameters (Å^2) at ambient conditions of the burbankite studied in this work.

	U^{11}	U^{22}	U^{33}	U^{23}	U^{13}	U^{12}
A (Na, Ca)	0.0145(8)	0.0182(10)	0.0197(10)	-0.0007(7)	-0.0003(3)	0.0091(5)
B (Ca, La)	0.01207(18)	0.0152(2)	0.0116(2)	-0.0009(3)	-0.00043(17)	0.00762(12)
C(1)	0.0178(18)	0.0178(18)	0.007(4)	0	0	0.0089(9)
C(2)	0.017(2)	0.017(2)	0.012(3)	0	0	0.0083(10)
C(3)	0.0090(16)	0.0126(12)	0.016(3)	0.0010(8)	0.0020(16)	0.0045(8)
O(1)	0.0164(14)	0.0315(13)	0.0185(19)	-0.0008(9)	-0.0017(18)	0.0082(7)
O(2)	0.0195(12)	0.0185(16)	0.0145(15)	0.0012(14)	0.0006(7)	0.0093(8)
O(3)	0.0204(11)	0.0193(11)	0.0212(11)	-0.0066(11)	-0.0033(10)	0.0134(10)
O (4)	0.0132(16)	0.0323(17)	0.039(2)	0.0016(8)	0.0033(17)	0.0066(8)

Table S2. Interatomic distances (Å) selected from the structural refinement of the burbankite studied in this work.

A-O(1)	2.3869(1)
-O(1)	2.4616(1)
-O(2)	2.3579(1)
-O(2)	2.3587(1)
-O(3)	2.3815(1)
-O(3)	2.3819(1)
-O(3)	2.7084(1)
-O(3)	2.7087(1)
<*A*-O>	2.4692
B-O(1)	2.7547(1)
-O(1)	2.7551(1)
-O(2)	2.4895(1)
-O(3)	2.4776(1)
-O(3)	2.4777(1)
-O(3)	2.6011(1)
-O(3)	2.6012(1)
-O(4)	2.6494(1)
-O(4)	2.6835(1)
-O(4)	2.6839(1)
<*B*-O>	2.6174
C(1)-O(1) x3	1.2871(1)
C(2)-O(4) x3	1.2715(1)
C(3)-O(2)	1.2681(1)
-O(3) x2	1.2941(1)
<*C*(3)-O>	1.2854

Table S3. Evolution with *P* of the *V* for the 8-fold and 10-fold coordinated polyhedra in burbankite structure.

	8-fold coordination polyhedron	10-fold coordination polyhedron
P (GPa)	*V* (Å^3)	*V* (Å^3)
0.001	26.0118	38.1327
0.16	25.9677	37.9823
0.54	25.7201	37.7399
1.24	25.4523	37.4934
2.09	25.1469	37.0552
3.02	24.6685	36.6828
3.70	24.5768	36.1478
5.03	24.0418	35.9333
6.06	23.6888	35.4887
6.65	23.5320	35.2665
7.07	23.4016	35.1863

(*P*-uncertainty: ±0.05 GPa)

Table S4. Evolution with *T* of the *V* for the 8-fold and 10-fold coordinated polyhedra in burbankite structure.

	8-fold coordination polyhedron	10-fold coordination polyhedron
T (K)	*V* (Å^3)	*V* (Å^3)
298	25.9868	37.9708
332	26.0632	38.0622
362	26.1034	38.1461
391	26.2531	38.0354
421	26.2819	38.1681
450	26.3212	38.3796
480	26.3768	38.4898
509	26.4732	38.5476
539	26.5496	38.6021
568	26.6186	38.6775
598	26.5599	38.7516
628	26.6047	38.9862

(*T*-uncertainty: ± 1 K)

Figure S1

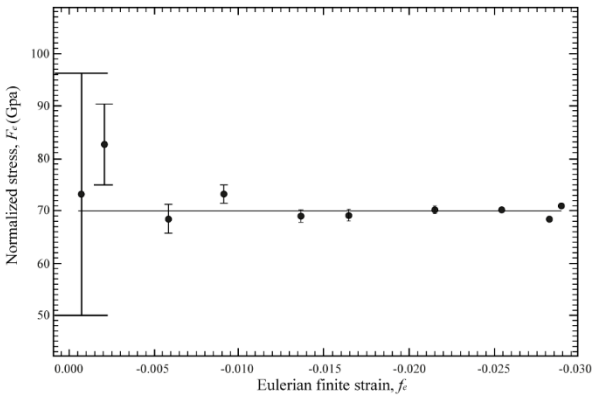

Figure S1. Normalized pressure (F_e) vs. Eulerian finite strain (f_e) plot for burbankite. The solid lines are weighted linear fits to the data.

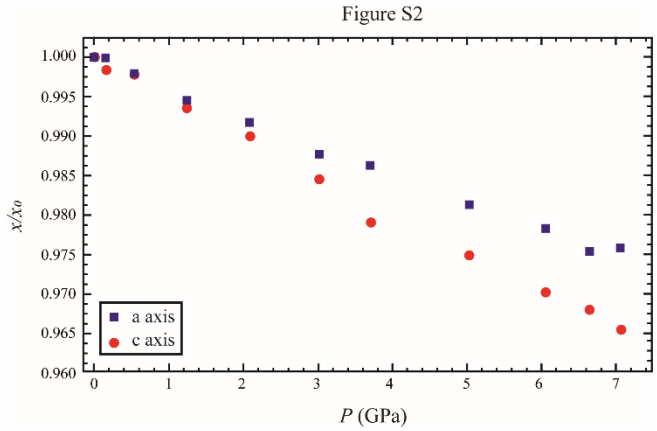

Figure S2. Axial compressibility of a (blue squares) and c (orange circles) axis. A axis is less compressible with respect to c axis. Error bars are within symbols.

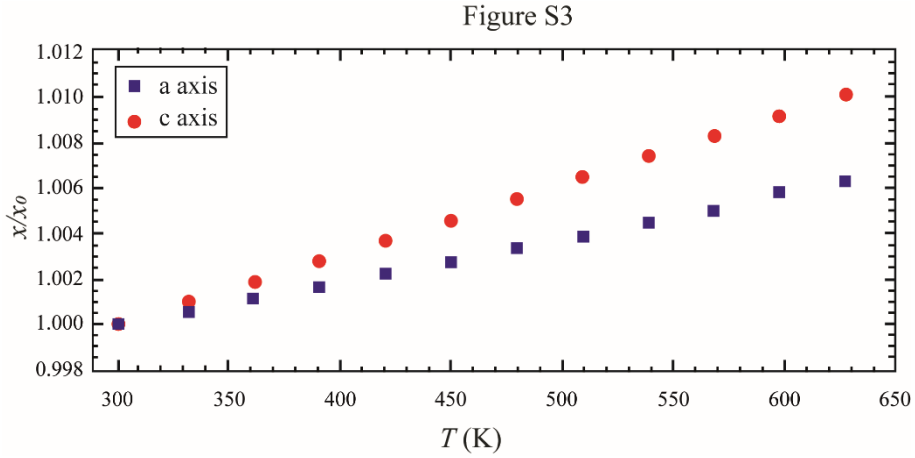

Figure S3. Axial thermal expansion of (blue squares) and c (orange circles) axis. The thermal behavior of the axes with *T* indicate a large anisotropy, with a axis less expandible with respect to c axis. Error bars are within symbols.