

Table S3: Tremolite bonding distances and tetrahedral double-chain configuration

Bonding Distances

Pressure (GPa)	0.0001	4.24	9.61	13.1	16.8	23.6	29.2
Ca1-O							
Ca1-O2(x2)	2.411(3)	2.340(12)	2.334(6)	2.301(7)	2.295(4)	2.297(11)	2.217(9)
Ca1-O4(x2)	2.324(3)	2.314(14)	2.266(7)	2.257(9)	2.246(5)	2.209(14)	2.152(11)
Ca1-O5(x2)	2.757(3)	2.682(13)	2.554(6)	2.517(7)	2.474(4)	2.369(9)	2.334(8)
Ca1-O6(x2)	2.529(3)	2.503(14)	2.480(7)	2.486(8)	2.475(5)	2.495(10)	2.435(10)
Avg Ca1-O	2.505	2.460	2.409	2.390	2.375	2.345	2.285
Std Dev	0.188	0.170	0.132	0.130	0.120	0.121	0.125
Mg1-O							
Mg1-O1(x2)	2.064(3)	2.069(12)	2.019(6)	2.023(8)	2.015(4)	2.010(13)	1.948(9)
Mg1-O2(x2)	2.068(3)	2.072(13)	2.026(6)	2.003(8)	1.971(4)	1.991(11)	1.915(10)
Mg1-O3(x2)	2.072(2)	2.076(15)	2.048(6)	2.021(8)	2.009(4)	1.946(11)	1.944(11)
Avg Mg1-O	2.068	2.072	2.031	2.016	1.998	1.982	1.936
Std Dev	0.004	0.004	0.015	0.011	0.024	0.033	0.018
Mg2-O							
Mg2-O1(x2)	2.140(3)	2.128(13)	2.085(5)	2.050(7)	2.059(4)	2.034(12)	1.987(10)
Mg2-O2(x2)	2.087(3)	2.050(12)	2.009(6)	2.000(8)	1.980(4)	1.993(13)	1.900(9)
Mg2-O4(x2)	2.019(3)	2.016(15)	1.989(7)	1.972(8)	1.960(5)	1.914(13)	1.882(11)
Avg Mg2-O	2.082	2.064	2.027	2.007	2.001	1.980	1.923
Std Dev	0.061	0.057	0.051	0.040	0.041	0.061	0.056
Mg3-O							
Mg3-O1(x4)	2.068(3)	2.047(12)	2.007(6)	1.983(7)	1.961(4)	1.956(12)	1.884(10)
Mg3-O3(x2)	2.041(3)	2.063(16)	2.025(6)	2.035(9)	2.030(5)	2.003(14)	1.989(13)
Avg Mg3-O	2.059	2.052	2.013	2.007	1.984	1.972	1.919
Std Dev	0.016	0.009	0.010	0.026	0.040	0.027	0.061
Si1-O							
Si1-O1	1.606(2)	1.602(17)	1.593(8)	1.589(11)	1.587(6)	1.510(16)	1.567(14)
Si1-O5	1.635(3)	1.604(13)	1.621(6)	1.613(9)	1.613(5)	1.629(12)	1.584(10)
Si1-O6	1.634(3)	1.628(12)	1.623(6)	1.616(7)	1.616(4)	1.558(10)	1.597(8)
Si1-O7	1.620(2)	1.645(12)	1.625(6)	1.616(7)	1.614(4)	1.575(10)	1.587(9)
Avg Si1-O	1.624	1.619	1.616	1.608	1.608	1.568	1.584
Std Dev	0.014	0.021	0.015	0.013	0.014	0.049	0.013
Si2-O							
Si2-O2	1.615(2)	1.614(16)	1.580(7)	1.571(10)	1.584(6)	1.468(15)	1.532(13)
Si2-O4	1.589(3)	1.573(14)	1.569(6)	1.581(8)	1.574(5)	1.568(12)	1.554(11)
Si2-O5	1.651(3)	1.658(12)	1.647(6)	1.629(7)	1.625(4)	1.613(10)	1.608(9)
Si2-O6	1.676(3)	1.649(13)	1.657(6)	1.651(8)	1.637(4)	1.623(11)	1.599(9)
Avg Si2-O	1.633	1.624	1.613	1.608	1.605	1.568	1.573
Std Dev	0.038	0.039	0.045	0.038	0.031	0.071	0.036

Tetrahedral Double-Chain Configuration

Pressure (GPa)	0.0001	4.24	9.61	13.1	16.8	23.6	29.2
O6-O7-O6	108.4	104.5	101.7	98.3	97.1	93.9	90.9
O7-O6-O5	131.8	134.1	137.8	140.6	141.8	145.5	147.3
O5-O7-O5	133.6	137.9	141.4	143.6	145.4	148.5	150.2
O7-O5-O6	107.2	104.5	100.7	98.3	96.8	92.7	91.7
Tetrahedral rotation	12.5	15.6	19.2	21.9	23.3	26.9	28.7
O5-O6-O5 (180°=fully extended chain)	167.8	166.8	162.3	159.9	158.6	153.1	153.4