# Supporting Information for:

# Pressure destabilizes oxygen vacancies in bridgmanite

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This Supporting Information file contains:

* **Table S1.** Lattice parameters and d-spacings of bridgmanite from runs I-574, I-873, and I-909 based on the X-ray diffraction spectra in Fig. 4.
* **Table S1** Lattice parameters and d-spacings of bridgmanite from runs I-574, I-873, and I-909 based on the X-ray diffraction spectra in Fig. 4.

|  |  |  |  |
| --- | --- | --- | --- |
|  | I-574-MgOa=4.978(2), b=4.976(2), c=6.963(3) V=166.2(3) Å3 | I-574-MgOa=4.961(3), b=4.967(3), c=6.955(4) V=164.4(3) Å3 | I-909-MgOa=4.773(4), b=4.948(4), c=6.901(3) V=163.0(3) Å3 |
| (hkl) | 2θobs | 2θcal | d-spacing (Å) | 2θobs | 2θcal | d-spacing (Å) | 2θobs | 2θcal | d-spacing (Å) |
| 0 0 2 | 29.80 | 29.80 | 3.482 | 29.74 | 29.81 | 3.488 | 30.00 | 30.08 | 3.459 |
| 1 1 0 | 30.00 | 30.04 | 3.459 | 30.24 | 30.19 | 3.431 | 30.24 | 30.21 | 3.432 |
| 1 1 1 | 33.69 | 33.63 | 3.089 |  |  |  |  |  |  |
| 0 2 0 | 42.10 | 42.16 | 2.492 |  |  |  |  |  |  |
| 1 1 2 | 42.69 | 42.83 | 2.459 | 43.04 | 42.94 | 2.440 | 43.13 | 43.15 | 2.435 |
| 2 0 0 | 43.77 | 43.83 | 2.401 |  |  |  |  |  |  |
| 1 2 0 | 47.84 | 47.80 | 2.208 |  |  |  |  |  |  |
| 1 0 3 | 50.84 | 50.74 | 2.085 |  |  |  |  |  |  |
| 2 1 1 | 51.41 | 51.41 | 2.064 |  |  |  |  |  |  |
| 0 2 2 | 52.54 | 52.48 | 2.023 |  |  |  |  |  |  |
| 2 0 2 | 53.81 | 53.90 | 1.978 |  |  |  |  |  |  |
| 1 1 3 | 55.41 | 55.38 | 1.925 |  |  |  |  |  |  |
| 1 2 2 | 57.23 | 57.36 | 1.869 |  |  |  |  |  |  |
| 2 1 2 | 58.35 | 58.37 | 1.836 |  |  |  |  |  |  |
| 0 0 4 | 61.86 | 61.90 | 1.742 | 61.97 | 61.92 | 1.739 | 62.55 | 62.53 | 1.724 |
| 2 2 0 | 62.45 | 62.44 | 1.727 | 62.83 | 62.78 | 1.717 | 62.79 | 62.81 | 1.718 |
| 0 2 3 | 63.62 | 63.66 | 1.698 |  |  |  |  |  |  |
| 2 2 1 | 64.52 | 64.55 | 1.677 |  |  |  |  |  |  |
| 1 3 0 | 69.68 | 69.61 | 1.567 |  |  |  |  |  |  |
| 3 0 1 | 70.18 | 70.12 | 1.557 |  |  |  |  |  |  |
| 1 1 4 | 70.41 | 70.33 | 1.553 | 70.71 | 70.63 | 1.547 | 70.96 | 71.00 | 1.542 |
| 2 2 2 | 70.81 | 70.70 | 1.545 | 71.07 | 71.03 | 1.540 | 71.18 | 71.20 | 1.538 |
| 1 3 1 | 71.72 | 71.62 | 1.528 | 71.79 | 71.90 | 1.527 |  |  |  |
| 1 3 2 | 77.49 | 77.52 | 1.430 | 77.74 | 77.79 | 1.426 | 78.16 | 78.13 | 1.420 |
| 0 2 4 | 77.73 | 77.74 | 1.427 | 77.93 | 77.85 | 1.423 | 78.42 | 78.50 | 1.416 |
| 2 0 4 | 78.85 | 78.91 | 1.409 | 79.22 | 79.14 | 1.404 | 79.72 | 79.62 | 1.397 |
| 3 1 2 | 79.83 | 79.85 | 1.395 | 80.35 | 80.37 | 1.387 | 80.35 | 80.37 | 1.387 |