

**Pressure-Volume data for orthorhombic perovskite, opv, (Mg, Fe, Al, Si)O<sub>3</sub> from peridotite sample BN-35 (Stern et al., 1986) at room temperature**

Sample	P (GPa)	P err (GPa)	OPV Vol (Å <sup>3</sup> )	OPV Vol err (Å <sup>3</sup> )	OPV V0 (Å <sup>3</sup> )	OPV V0 err (Å <sup>3</sup> )	compression or decompression
Per_500_12	1.1	0.32	162.95	0.700711	164.371	0.1926	decompression
Per_500_11	24.2	3.39	154.164	0.1	164.371	0.1926	decompression
Per_500_04	34.5	1.36	145.656	0.0768606	164.371	0.1926	compression
Per_601_dac1_05	35	1	148.617	0.400495	164.171	0.315	compression
Per_500_10	35	3.95	149.446	1.18885	164.371	0.1926	decompression
Per_601_dac1_07	41	1	146.027	0.342272	164.171	0.315	compression
Per_500_05	42.3	0.24	144.449	1.57255	164.371	0.1926	compression
Per_500_06	44.9	0.75	143.833	0.2	164.371	0.1926	compression
Per_601_dac1_09	47	1	145.224	0.4	164.171	0.315	compression
Per_101_05	51.5	0.4	141.674	0.2	163.769	0.0804	compression
Per_500_07a	51.8	0.48	142.853	0.3	164.371	0.1926	compression
Per_500_09	54.4	0.21	142.952	0.483529	164.371	0.1926	decompression
Per_500_08	59.5	1.42	141.114	0.353355	164.371	0.1926	compression
Per_101_06	65.5	2.4	139.958	0.257221	163.769	0.0804	compression
Per_101_07	78.1	3.2	136.658	0.294716	163.769	0.0804	compression
Per_101_09	86.6	3.9	134.009	0.953544	163.769	0.0804	compression

**Per\_500** data points were synthesized at 34.5 GPa and ~2000 K, no further heating at given pressures. Data taken on compression, decompression (see last column) and on quench to room conditions. Data taken at the Stanford Synchrotron Radiation Laboratory, lambda=0.7277 Å, image plates

**Per\_101** data points were heated prior to each XRD pattern at every pressure. Data taken in compression and on quench to room conditions. Data taken at the Stanford Synchrotron Radiation Laboratory, lambda=0.7277 Å, image plates

**Per\_601** data points were heated prior to each XRD pattern at every pressure. Data taken in compression and on quench to room conditions. Data taken at GSECARS, Argonne National Laboratory, lambda=0.4246 Å, image plates

**For all Per\_\* data, see the following papers for more information:**

K. K. M. Lee, B. O'Neill, W. R. Panero, S.-H. Shim, L. R. Benedetti and R. Jeanloz, "Equations of state of the high-pressure phases of a natural peridotite and implications for the Earth's lower mantle," Earth & Planetary Science Letters, 223(3-4), 381-393, (2004).

K. K. M. Lee, B. O'Neill, R. Jeanloz, "Limits to resolution in composition and density in ultra high-pressure experiments on natural mantle-rock samples," Physics of the Earth and Planetary Interiors, 143-144, 241 (2004).

**Additional P-V data on peridotite BN-35 used in above studies can be found in:**

Oneill, B., Experimental petrology of the lower mantle, PhD thesis, UC, Berkeley (1994).

**\*\*\*When using the data listed above, please reference the above K. K. M. Lee et al.(2004) papers. Thank you.\*\*\***

**Pressure-Volume data for magnesiowustite, mw, (Mg, Fe)O  
from peridotite sample BN-35 (Stern et al., 1986) at room temperature**

Sample	P (GPa)	P err (GPa)	MW Vol (Å <sup>3</sup> )	MW Vol err (Å <sup>3</sup> )	MW V0 (Å <sup>3</sup> )	MW V0 err (Å <sup>3</sup> )	compression or decompression
Per_500_12	1.1	0.32	74.7184	0.122951	75.8309	0.126	decompression
Per_500_11	24.2	3.39	67.563	0.12813	75.8309	0.126	decompression
Per_500_04	34.5	1.36	63.7986	0.0872333	75.8309	0.126	compression
Per_601_dac1_05	35	1	64.6733	0.233022	75.71	0.0821	compression
Per_500_10	35	3.95	65.486	0.108319	75.8309	0.126	decompression
Per_601_dac1_07	41	1	64.2622	0.214527	75.71	0.0821	compression
Per_500_05	42.3	0.24	63.2297	0.0966742	75.8309	0.126	compression
Per_500_06	44.9	0.75	62.9206	0.0812052	75.8309	0.126	compression
Per_601_dac1_09	47	1	63.7555	0.0384226	75.71	0.0821	compression
Per_101_05	51.5	0.4	61.8747	0.0582561	75.7289	0.135	compression
Per_500_07a	51.8	0.48	62.386	0.0997575	75.8309	0.126	compression
Per_500_09	54.4	0.21	62.1152	0.124561	75.8309	0.126	decompression
Per_500_08	59.5	1.42	61.123	0.299567	75.8309	0.126	compression
Per_101_06	65.5	2.4	60.6384	0.368925	75.7289	0.135	compression
Per_101_07	78.1	3.2	58.3346	0.117235	75.7289	0.135	compression
Per_101_09	86.6	3.9	56.6936	0.0511226	75.7289	0.135	compression

**Per\_500** data points were synthesized at 34.5 GPa and ~2000 K, no further heating at given pressures.  
Data taken on compression, decompression (see last column) and on quench to room conditions.  
Data taken at the Stanford Synchrotron Radiation Laboratory, lambda=0.7277 Å, image plates

**Per\_101** data points were heated prior to each XRD pattern at every pressure.  
Data taken in compression and on quench to room conditions.  
Data taken at the Stanford Synchrotron Radiation Laboratory, lambda=0.7277 Å, image plates

**Per\_601** data points were heated prior to each XRD pattern at every pressure.  
Data taken in compression and on quench to room conditions.  
Data taken at GSECARS, Argonne National Laboratory, lambda=0.4246 Å, image plates

**For all Per\_\* data, see the following papers for more information:**

K. K. M. Lee, B. O'Neill, W. R. Panero, S.-H. Shim, L. R. Benedetti and R. Jeanloz, "Equations of state of the high-pressure phases of a natural peridotite and implications for the Earth's lower mantle," Earth & Planetary Science Letters, 223(3-4), 381-393, (2004).

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**Pressure-Volume data for calcium perovskite, cpv, CaSiO<sub>3</sub>  
from peridotite sample BN-35 (Stern et al., 1986) at room temperature**

Sample	P (GPa)	P err (GPa)	CPV Vol (Å <sup>3</sup> )	CPV Vol err (Å <sup>3</sup> )	compression or decompression
Per_500_12	1.1	0.32	47.2616	0.0357731	decompression
Per_500_11	24.2	3.39	41.3471	0.0971322	decompression
Per_500_04	34.5	1.36	41.1429	0.0328212	compression
Per_601_dac1_05	35	1	41.4067	0.0248765	compression
Per_500_10	35	3.95	39.9245	0.0657563	decompression
Per_601_dac1_07	41	1	40.5431	0.0406779	compression
Per_500_05	42.3	0.24	41.0376	0.017722	compression
Per_500_06	44.9	0.75	40.403	0.0220256	compression
Per_601_dac1_09	47	1	40.478	0.114348	compression
Per_101_05	51.5	0.4	39.4896	0.19438	compression
Per_500_07a	51.8	0.48	40.1626	0.0436731	compression
Per_500_09	54.4	0.21	38.5898	0.133312	decompression
Per_500_08	59.5	1.42	39.3213	0.0314446	compression
Per_101_06	65.5	2.4	not obs.		
Per_101_07	78.1	3.2	not obs.		
Per_101_09	86.6	3.9	not obs.		

**Per\_500** data points were synthesized at 34.5 GPa and ~2000 K, no further heating at given pressures. Data taken on compression, decompression (see last column) and on quench to room conditions. Data taken at the Stanford Synchrotron Radiation Laboratory, lambda=0.7277 Å, image plates

**Per\_101** data points were heated prior to each XRD pattern at every pressure. Data taken in compression and on quench to room conditions. Data taken at the Stanford Synchrotron Radiation Laboratory, lambda=0.7277 Å, image plates

**Per\_601** data points were heated prior to each XRD pattern at every pressure. Data taken in compression and on quench to room conditions. Data taken at GSECARS, Argonne National Laboratory, lambda=0.4246 Å, image plates

**For all Per\_\* data, see the following papers for more information:**

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