

APPENDIX

The in situ elastic wave velocity measurements of anorthite were performed twice. In first experiments (S2646), the measurements were carried out under load of 150 ton and 250 ton after preheating process. We, however, could not obtain reliable temperature and pressure data at except for room temperature because thermocouple was broken during preheating process. In second experiment (S2708), we succeeded to measure the temperature directly by thermocouple, and the reliable data in wide pressure and temperature range were corrected (see text). Therefore, only the second experiment was used for the discussion. Here, to prove reproducibility of the elastic wave velocity anomalies observed by S2708, the results of S2646 are compared. Temperature in S2646 was estimated using relation between temperature and electric power at the same loads in S2708. In S2646, pressures at room temperature after heating was calculated from the EOS of MgO as 1.5 GPa for 150 ton and 3.1 GPa for 250 ton, respectively. The pressure at 150 tons was higher than that of 150 tons of S2708, and, in the case of 250 tons, it becomes lower. Therefore there may be larger uncertainty in this temperature estimation. As shown in Figure A1, the elastic wave velocity anomalies were evident in the experiment of S2646. The variation of V_p of S2646 agrees well with that of S2706. In the experiments at 150 ton, the V_s of S2646 becomes slower than that of S2708. The lower V_s in S2646 are considered to originate from the difference in pressure because the dV_s/dP shows a negative though dV_p/dP is constant at below ~4 GPa. In conclusion, these comparisons demonstrate the reproducibility of our experiments.

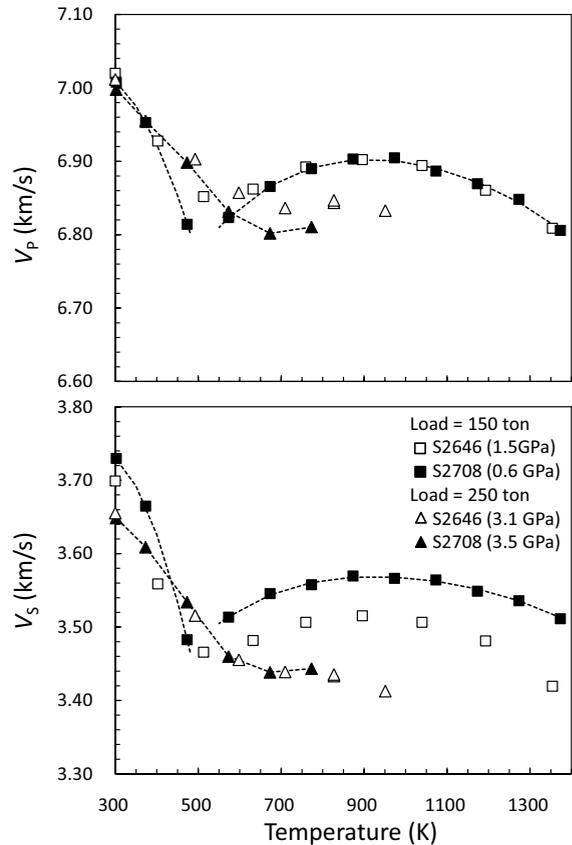


FIGURE A1. Elastic wave velocities as a function of temperature in S2646 and S2708.