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Correction to "Thermally Induced Phase Changes, Lateral Heterogeneity of the Mantle, Continental Roots, and Deep Slab Anomalies" by Don L. Anderson

In the paper "Thermally Induced Phase Changes, Lateral Heterogeneity of the Mantle, Continental Roots, and Deep Slab Anomalies" by Don L. Anderson (*Journal of Geophysical Research*, *92*(B13), 13,968–13,980, 1987), Figures 1–5 were placed in the wrong order. The correct figures and their captions are given below.

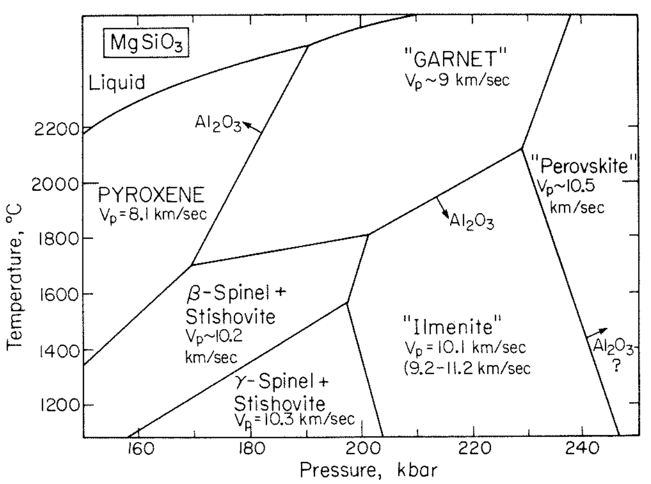

Fig. 1. Provisional phase relations in $MgSiO_3$ (modified from *Kato and Kumazawa* [1985], *Sawamoto* [1986], and *Akaogi et al.* [1986]). The arrows show the direction that the phase boundaries are expected to move when Al_2O_3, or garnet, is added. The approximate compressional velocities are shown for each phase.

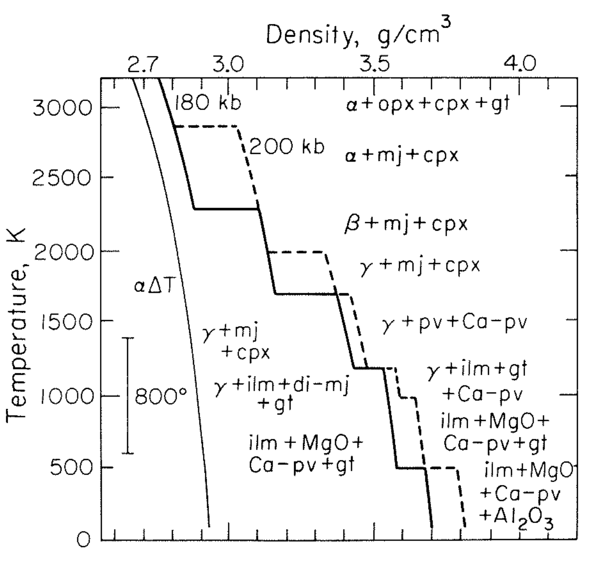

Fig. 2. Approximate variation of zero-pressure density with temperature taking into account thermal expansion (curve to left) and phase changes at two pressures. The effect of pressure on density is not included; $\alpha\Delta T$ is not linear since α increases with T and generally decreases from low-density phases to high-density phases. The inclusion of density jumps associated with phase changes increases the average effect of temperature by a factor of 3–4. At phase boundaries the effect is much larger. The phases stable over each temperature interval are also shown. The abbreviations are α (olivine), β (β-spinel), γ (γ-spinel), opx (orthopyroxene), cpx (clinopyroxene), gt (garnet), mj ($MgSiO_3$-majorite), pv ($MgSiO_3$-perovskite), Ca-pv ($CaSiO_3$-perovskite), ilm ($MgSiO_3$-ilmenite), mw (magnesiowüstite), s.s. (solid solution).

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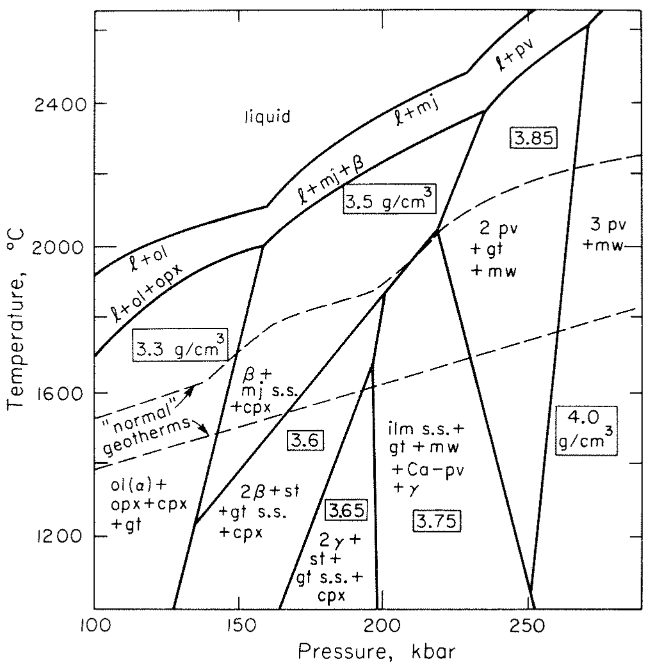

Fig. 3. Provisional facies map in the system MgO–SiO_2–CaO–Al_2O_3 with an ol > opx > cpx ~ ga mineralogy at low pressure, based on a synthesis of a variety of subsolidus and melting experiments on peridotites. The geotherms bracket most estimates of temperatures in "normal" or average mantle. Warmer parts of the mantle may be near the solidus; the interiors of slabs may be 800°C colder. The phase diagram is based on incomplete and sometimes inconsistent reconnaissance experiments and must be taken as provisional until systematic and reversed experiments are performed. Based on experiments and interpretations by *Kato and Kumazawa* [1985, 1986], *Akaogi and Akimoto* [1977], *Ohtani et al.* [1986, 1987], *Kanzaki* [1987], *Ito and Takahashi* [1986], *Yamada and Takahashi* [1984], *Irifune et al.* [1986], and *Sawamoto* [1986]. See also *Ito and Navrotsky* [1985], *Akaogi et al.* [1984], *Navrotsky et al.* [1979], and *Kushov and Galimzyanov* [1986]. The 2β and 2γ mean that both Mg_2SiO_4 and $MgSiO_3$ have transformed to a spinel assemblage.

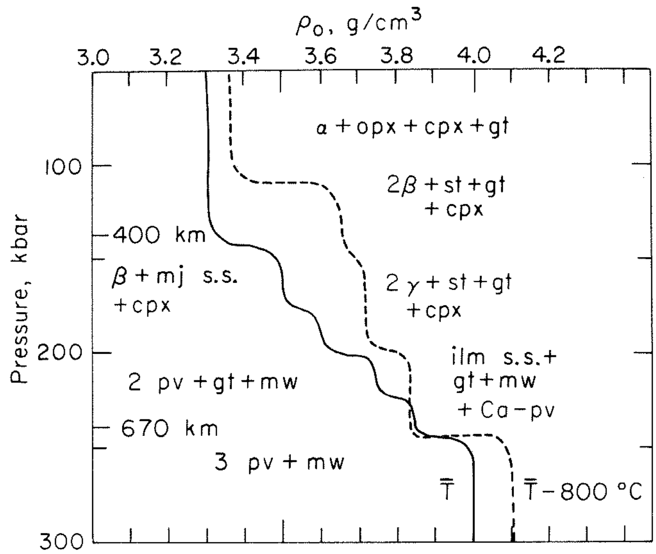

Fig. 4. Zero-pressure density calculated from Figure 3 for peridotite at two temperatures (the mean of the "normal" geotherms and a temperature 800°C colder). Phase changes and thermal expansion are included. The density differences would be different for an eclogitic mantle or for a slab which differs in chemistry from the surrounding mantle. Abbreviations are α (olivine), opx (orthopyroxene), cpx (clinopyroxene), gt (garnet), gt s.s. (garnet plus majorite, mj), st (stishovite), ilm s.s. ($MgSiO_3$ ilmenite + gt-ilmenite), mw (magnesiowüstite), l (liquid).

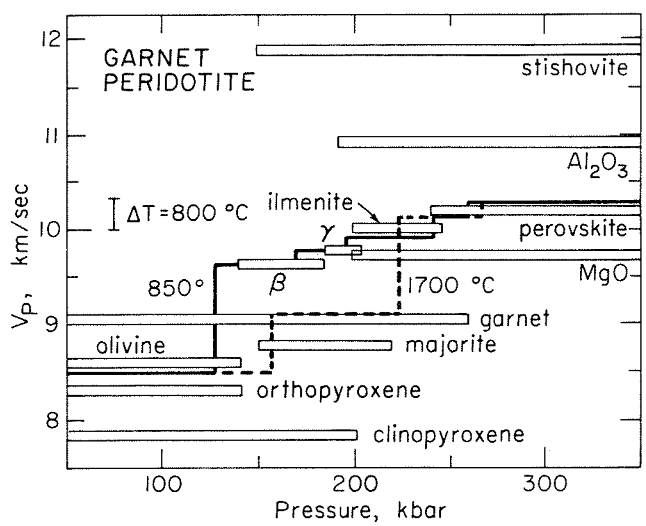

Fig. 5. Compressional velocities, at standard conditions, and stability fields of mantle minerals. The approximate velocity of garnet peridotite, at standard conditions ($P = 0$, $T \sim 20$°C) for phases stable at two temperatures (850°C, 1700°C) is also shown. The small bar gives the approximate change in V_p for an 800°C change in temperature ($\partial V_p/\partial T = -4.1 \times 10^{-4}$ km/s °C).

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