Geophysical Research Abstracts
Vol. 13, EGU2011-7539, 2011
EGU General Assembly 2011

Calculated phase relations of depleted mantle lithosphere

Stephan Klemme
Universität Münster, Institut für Mineralogie, Münster, Germany (stephan.klemme@uni-muenster.de)

Phase relations in several different peridotite compositions were calculated using free energy minimization techniques and the software package Perplex. We show that the stability fields of garnet and spinel in upper mantle lithosphere critically depend on the bulk composition of the peridotite. In fertile bulk compositions, the transition from spinel to garnet-bearing rocks is relatively sharp but in depleted bulk compositions there is a large pressure-temperature field where garnet and spinel coexist.
Calculated phase relations of this sort may be used to constrain the origin of garnet and spinel-bearing mantle peridotites or to interpret observed garnet compositions which are commonly used as diamond indicator minerals.