Solubility of Al2O3 in phase G

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Phase relations in the MgO-Al2O3-SiO2-H2O systems were investigated in the pressure range from 19 to 21GPa and the temperatures from 1073 K to 1473 K.

Phase G contained Al2O3 up to 28wt.%. The compositional field of phase G expands in the MgO-Al2O3-SiO2-H2O systems. The a-axis expands, whereas c-axis shortens with increasing Al2O3 content in phase G. Phase G containing Al2O3 decomposes at a temperature lower than that of Al2O3 free phase G.

The present study shows that phase G can exist in a large compositional field in the systems from MgO-SiO2-H2O to MgO-Al2O3-SiO2-H2O. Hence, phase G is considered to exist in natural slab conditions not only in the peridotite layer but also in the regions of the pelitic sediment, mantle wedge MORB.