Poster Presentation

MS27.P01

In situ Investigations from Spinels under high pressure and high Temperatures

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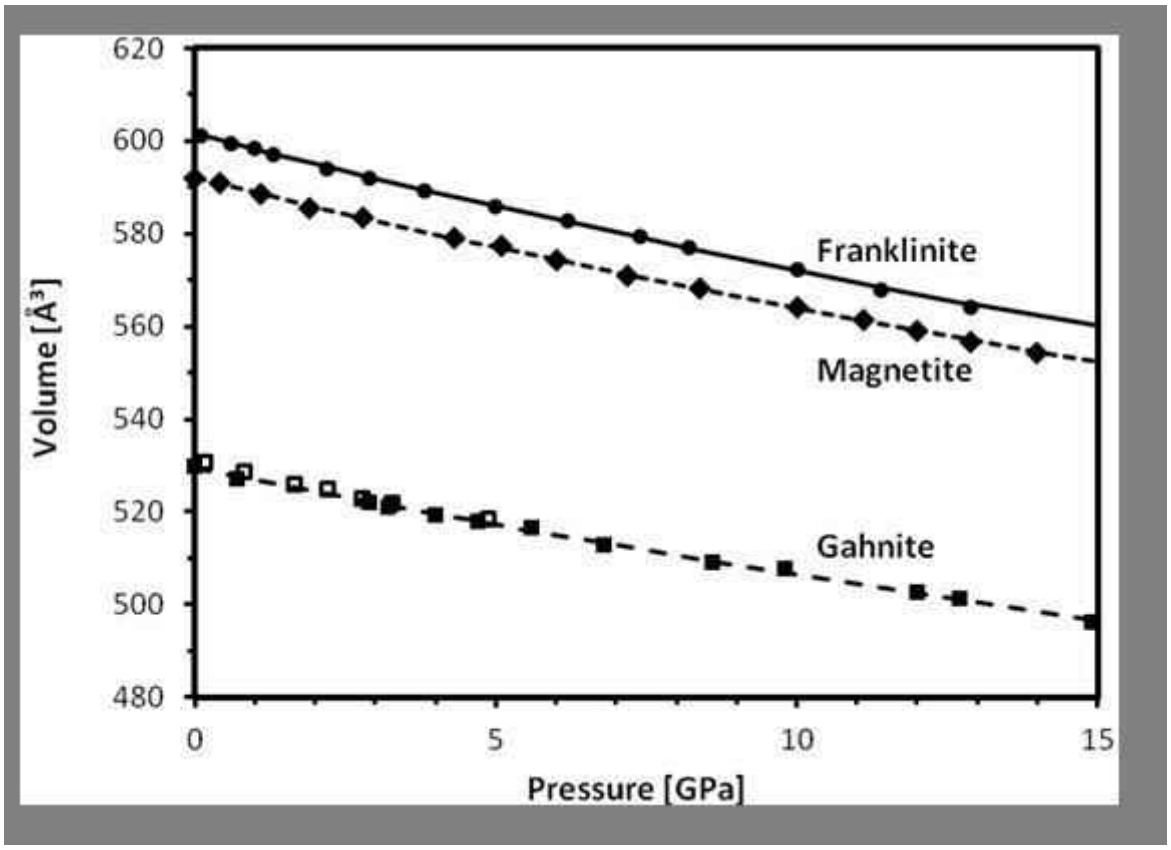
Spinels seem to be important constituents of the deep interior of the Earth while transition with spinel or pseudospinel structure strongly influence the dynamic of the mantle. On the other hand, spinels are widely used as artificial material. The spinels Magnetite, Franklinite, and Gahnite are investigated at the Hamburger Synchrotron Laboratory (HASYLAB) at Hamburg. The experiments were carried out using the high pressure multi anvil devices MAX80 (F2.1 Beamline) and MAX200x (W2 Beamline). The MAX80 is a single state apparatus located at a bending magnet, MAX200x is a double state system located at a wiggler. Energy-dispersive X-ray diffraction in combination with Rietveld refinement [1, 2] was used to determine the pressure and temperature induced volume change. Isothermal experiments were performed up to 15 GPa at ambient temperature. The temperature and pressure dependent volume change were derived from compression experiments using MAX80 apparatus up to 5 GPa at temperatures of 298, 500, 700, 900 and 1100 K. Bulk moduli at ambient temperatures using a Birch-Murnaghan equation of state result in KT=184(7) GPa with K'=4.5(2) for Magnetite, KT =178(6) with K'=4.6(4) for Franklinite, and KT =204(9) with K'=4.9(6) for Gahnite.

[1] *Rietveld, H.M. (1967) Line profiles of neutron powder-diffraction peaks for structure refinement. Acta Crystallographica, 22,151–152.,* ***[2]*** *Riedveld, H.M. (1969) A Profile Refinement Method for Nuclear and Magnetic Structures. Journal of Applied Crystallography, 2, 65–71.*



Keywords: High pressure, Spinels, Equation of State