

Mantle xenoliths from Kostomuksha lamproites/orangeites, NW Russia

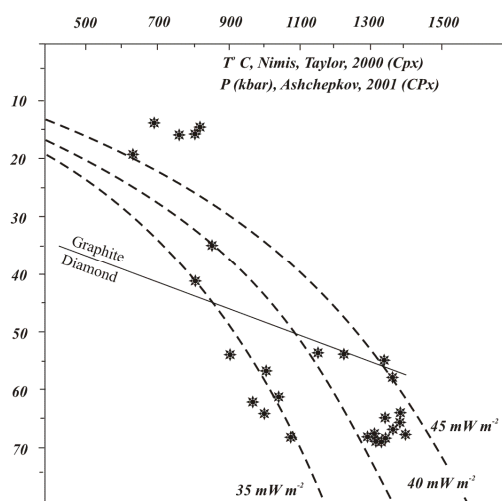
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Mantle xenoliths have been recovered from olivine-phlogopite lamproite/orangeite dike at the Kostomuksha iron open-pit, Karelia (about 25 nodules). The mantle xenolith suite includes the following rock types: spinel lherzolite (40%), former garnet (breakdown) lherzolite (30%), former garnet (breakdown) harzburgite (10%) and dunite (20%). No eclogite xenoliths are recorded. Minerals in these xenoliths have been analyzed with EDX and used to calculate pressure-temperature arrays (CPx-equations). CPx, CrSp and rare OPx (up to 1.6 wt.% CaO) are only phases of the primary association. There are no fresh garnets in these nodules, all of them are presented by very fine symplectic intergrowth (breakdown) of CrSp (up to 35-40 wt.% Cr₂O₃ and 5-8 wt.% Al₂O₃) with CPx (secondary assoc.) and lizardite (K-silicates). REE and trace elements in CPx were analyzed with by LAICPMS.

Single-grain chromian diopside (primary assoc.) thermobarometry [1,2] shows the wide range of equilibration temperatures, mostly in a hot area (up to 1400°C) between 35 and 45 mW/m² geotherms (see figure). These new PT estimates indicate that former garnet lherzolites took place derived within the diamond stability field (with not exactly defined geotherm character yet).



References

- [1] Nimiz P. & Taylor W.R. (2000) *Contrib. Min. Petrol* **139**, 514-554.
- [2] Ashchepkov I. V. (2001) *Experiment in Geosciences* **10**, 137-138.