



Evolution of mantle column beneath Bartoy volcanoes.

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Pleistocene Bartoy volcanoes 1.5-0.8 Ma (Ashchepkov et al., 2003) represent variable set of hydrous cumulates and megacrysts and peridotite mantle xenoliths from spinel facies (Ashchepkov, 1991; Ionov, Kramm, 1992). Hydrous peridotites give series of the temperature groups: 1) deformed Fe – lherzolites (1200-1100o) , 2) Phl porphyroclasti (1100-1020o), 3) Amph –Phl (1020-940o), 4) Dry protogranular (1020-940o), 5) Amph equigranular (940-880o) and 6) dry and fine grained (880-820o). and Fe-rich poikilitic (700-600o) (Ashchepkov, 1991). T according (Nimis, Taylor, 2000)

The sequence of the megacrysts crystallized on the wall of basaltic feeder in pre - eruption stage is starting from HT dark green websterites (1300-1200o), black Cpx- Gar varieties (1250-1200o) evolved to Phl –CPx (1200-1130o) and Cpx – Kaers (1130-1020o) – Cpx low in TiO₂, Ilm and San (<1000o) like in Vitim (Ashchepkov et al., 2011). The differentiation trends looks branched but the question if they. Differentiation in relatively large magma bodies produced Ga- Cpx (+Amph-Phl- Ilm +-San) and then Cpx-Gar –Pl cumulates in (~8-12 kbar) interval. In the ToC-Fe# diagram the Intermediate trend between lherzolites and megacrysts sub parallel to lherzolitic is correspondent to the fractionation of the hydrous alkali basalt melts in vein network created from the highly H₂O bearing basaltic derivatives formed in intermediate magma chambers. The interaction of the peridotites with the pulsing rising and evolving basaltic system produced the wall rock metasomatism and separate groups of peridotites in different levels of mantle column. PT calculations show two PT path and probably melt intrusion events.

Trace elements in glass from crystalline basalts show Zr, Pb dips and Ta, Nb, Sr enrichment for the black megacrystalline Cpx , Gar series. They show link with evolved basalts by HFSE, Ba enrichment but Cpx from kaersutite and further Gar – Cpx cumulates show depressions in Ta, Nb, Zr, and Pb moderate enrichment in LILE and Sr. Pl – Gar cumulates show even jugged TRE spidergrams with Eu peaks and dips.

The green Cpx from green series have now humps in TRE related to the garnet in melting source and are depleted in HFSE especially in Zr suggesting H₂O- induced melting. Lherzolitic Cpx show enrichment in LREE and LILE but decrease in HFSE.

The Cpx in contacts with basaltic derivatives show U shaped REE and flattened patterns with Zr dips . The interaction is not highly pronounced and the distance of 3-4 sm.

Most probably that metasomatism in lherzolitic column was produced by melts more rich fluids.

The interaction with HT basalts produced the Fe lherzolites with the TRE patterns showing hump garnet signatures

The model of the developing of the mantle column beneath Bartoy volcanoes suggest pulsing interaction with the basalts are checking using TRE components of all studied samples. Grant 11-05-00060.