A STUDY OF MICROINCLUSIONS IN MINERALS OF SPANISH LAMPROITES.

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In order to estimate thermodinamic conditions and melt compositions of Spanish lamproites, microinclusions in olivine, clinopyroxene, sanidine, apatite, phlogopite, and calcite have been studied. Among daughter minerals in melt incusions Ol, Phl, San and F-Ap were determined. Unusual compositions of daughter minerals correspond to unusual chemistry of lamproitic lavas: i.e. San contains large quantities of both Mg and Fe, Phl contains up to 8 wt.% TiO_2 and more then 1 wt.% F.

Homogenization temperature of melt inclusions in the most magnesian olivine is 1250°C and decreases with increasing of X_{Fe} of Ol to 1050°C. Average composition of homogenized melt inclusions in the earliest olivine studied (X_{Fe}=0.08)is following: (wt.%)SiO_2 52.1, TiO_2 0.2, Al_2O_3 11.6, FeO(t) 3.9, MgO 5.4, CaO 0.1, BaO 0.3, Na_2O 0.9, K_2O 13.5, P_2O_5 3.4, F 0.9, Cl 0.3. The composition of the late-stage melts is represented by primary melt inclusion in calcite: SiO_2 64.7, TiO_2 0.8, Al_2O_3 17.8, FeO(t) 1.1, MgO 0.2, CaO 2.5, Na_2O 0.3, K_2O 4.6. Water content of this evolved melt is about 8 wt.%. For more primitive melts a value 4 wt.% have been estimated.

Fluid inclusions are mostly partially decrepitated low-dense CO_2. Sometimes salt crystalls on the walls of fluid inclusions are visible, proving high halogen concentrations in the fluid.

Daughter sanidine in melt inclusions contains appreciable amount of Fe^{3+} which is characteristic of high oxygen fugacity. On the other hand liquid immiscibility detected in residual glasses is possible only under relatively reduced conditions. Thus our data confirm highly variable oxygen fugacity during lamproite crystallization wich was advocated by Venturelli et al.(1988).

On the basis of our data we propose a model of primary melt formation by the melting of Phl-bearing lherzolite at relatively low pressures.