K130-015 **Room: 301A** **Time: May 19 14:15-14:30**

Peridotite nodules of French Central Massive: PT conditions and vesiculated glass by partial melting of phlogopite bearing vein

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Quaternary volcanoes in the Central Massif, France, brought peridotite xenoliths to the surface. Extensive studies were carried out with those peridotite samples by the use of petrography, trace element chemistry and isotopic compositions. Mercier and Nicolas (J. Petrol., 1975) suggested that the Puy Beaunit xenoliths were recrystallized and brought up from the shallower upper mantle, near the depth for the Moho discontinuity based on (1) the presence of spherical spinel and (2) the existence of transitional rock type from ultramafic to charnockitic with increasing silica contents. Also, clinopyroxenes of the Puy Beaunit xenoliths were characterized by (1) higher Sr and lower Nd isotopic compositions than those of the other peridotite xenoliths of the French Massif Central and (2) isotopic compositions similar to the granulite xenoliths derived from the lower crust underneath the French Massif Central (e.g. Downes and Dupuy, Earth Planet. Sci. Lett., 1987). On the basis of these isotopic and textural signatures of the Puy Beaunit peridotite xenoliths, Downes and Dupuy (Earth Planet. Sci. Lett., 1987) and Downes et al (Chem. Geol., 2003) also inferred that these peridotite xenoliths experienced with mechanical mixing between peridotite and enriched pyroxenite in the Moho region. In order to assess this hypothesis, we should know the pressure and temperature conditions of the peridotite xenoliths before the eruptions.

The xenoliths of Puy Beaunit show secondary equigranular and protogranular textures and the other xenoliths are protogranular and protogranular-to-porphyroclastic textures according to the definition of Mecier and Nicolas (J. Petrol., 1975). We examined the PT conditions of 10 peridotite xenoliths in scoria deposits from Puy Beaunit and Mont Briancon, and in Bruzet lava flow erupted at the Ray Pic crater, in the Massif Central, France. We determined the equilibrium temperatures based on the two-pyroxene geothermometer using chemical compositions of Ca-rich and Ca-poor pyroxenes (Wells, Contrib. Mineral. Petrol., 1977). A promising depth scale for the peridotites is the residual pressure of CO_2 fluid inclusions. If the residual pressure, and consequently the density, of CO_2 was determined, extrapolation of the pressure to the equilibrium temperature estimated from the mineral thermometer indicates the pressure of CO_2 when the fluid inclusions were thermally equilibrated with the surrounding host mineral in the deep Earth. Micro-Raman spectroscopy is highly effective for determining density of CO_2 in CO_2 fluid inclusions (Yamamoto and Kagi, Chem. Lett., 2006). The estimated ranges of equilibrium temperatures and pressures are 860-940C and 0.47-0.68 GPa for Puy Beaunit, 920-1000C and 0.95-1.1 GPa for Mont Briancon and 960-990C and 0.91-1.1 GPa for Bruzet, respectively. These results indicate that the Puy Beaunit xenoliths were derived from obviously shallower depths (around 17-25 km) than the other localities (around 32-42 km). We conclude that the peridotite xenoliths of Puy Beaunit were brought up from the slightly shallower depth than the present Moho depth (around 27km, Zanga et al., Contrib. Mineral Petrol., 1997), and this is consistent with the hypothesis by the previous studies.