

## **Melt inclusions in gabbroic xenoliths from Fuji volcano; implication for cryptic silicic magma chamber**

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Most of eruptives from Fuji volcano, Japan, are basaltic since 100 ka. However, the last eruption at 1707 discharged abundant silicic pumice, implying that silicic magma chamber is growing. The 1707 pyroclasts have gabbroic xenoliths in which melt inclusions are included in plagioclase crystals. These melt inclusions have information on the condition and evolution of magma chamber. In this study, we measured major element compositions of melt (glass) inclusions with their host plagioclase crystals. Compositions of FeTi-oxides and pyroxenes were also analyzed for geothermometry-oxybarometry. The xenoliths are olivine gabbro-norite-gabbro-norite and show adcumulate texture, indicating their cumulus origin. Melt inclusions are andesitic-rhyolitic compositions with  $\text{SiO}_2 = 55.5\text{-}76.4$  wt.% and show calc-alkaline trend. Basaltic melt is absent. FeTi oxides thermobarometry-oxybarometry yield  $\text{T-fO}_2$  conditions of ca. 750-950 °C and near Ni-NiO buffer for ilmenite-magnetite coexisting samples and pyroxene thermometry yields ca. 970-1006 °C for ilmenite-absent samples.  $\text{H}_2\text{O}$  contents in melt inclusions were estimated by using plagioclase-liquidus and melt-plagioclase An-partition thermohygrometers of Putirka (2008) with temperatures estimated by FeTi oxides and pyroxene thermometers. The melt  $\text{H}_2\text{O}$  contents estimated by the two methods are consistent, indicating that melt inclusions and their host plagioclase were equilibrated under the estimated temperature conditions. Melt  $\text{H}_2\text{O}$  contents are almost constant in each xenolith and vary in the range of ca. 4.6-10.1 wt.%.  $\text{SiO}_2$  and  $\text{H}_2\text{O}$  contents in melt inclusion increases as temperature decreases. The maximum  $\text{H}_2\text{O}$  content corresponds to melt  $\text{H}_2\text{O}$  solubility at ca. 400 MPa, indicating that crystallization occurred at the depth > 15 km. Fractional crystallization simulation using MELTS program well explains the observed compositional variation of melt. Our results indicate that (1) the gabbroic rocks were crystallized from andesitic-rhyolitic melts, (2) silicic magma chamber exists at depth > 13km, and (3) fractional crystallization was an essential differentiation mechanism in the magma chamber beneath Fuji volcano.