Amphiboles in olivine-hosted melt inclusions from eruption products of active volcanoes along volcanic front

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Amphiboles phases in olivine-hosted melt inclusions were found (Yamaguchi et al., 2001, 2003; Ohta et al., 2002, 2003, Kent and Elliott, 2002), although phenocryst phase of amphibole have not been found from eruption products along volcanic front in northeastern to central Japan. The amphiboles were 1) a daughter phase grown in olivine-hosted melt inclusion together with the other minerals (e.g. pyroxene, spinel, plagioclase); 2) dendritic daughter phase in rapidly cooled melt inclusion; and 3) trapped crystalline phase along with melt in host olivine phenocryst.

Following samples were investigated.
1. Ta-a scoria (1686 AD) of Tarumai volcano
2. Takeura scoria (45-43 ka) of Kuttara volcano
3. Kariya scoria (1739 AD) of Iwate volcano
4. Tennin pumice (1673 AD) of Asama volcano
5. Ishizu lava (3 ka) of Kusatsu-Shirane volcano

Most of olivine-hosted melt inclusions contain shrinkage bubble, and some include daughter phase minerals and/or trapped crystalline phase minerals. The inclusions have basaltic – basaltic andesite composition. These inclusions are expected to preserve the composition of mafic magma derived from subduction zone of island arc. It is suggested that the melt had enough water concentration to crystallize amphibole phase. Investigation of amphiboles in olivine-hosted melt inclusion is highly important to estimate water concentration of initial magma developed at subduction zone of island arc.