Transition of magma plumbing system deduced from the melt inclusions contained in tephra minerals originated from Aso central cones.

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Aso central cones produced basaltic to rhyolitic lavas and tephras after four gigantic pyroclastic eruptions, i.e. Aso-1, Aso-2, Aso-3, and Aso-4. Aso central cone pumice 1 ~ 6 (ACP1 ~ 6; Takada, 1989) represent voluminous volcanic products in post-caldera stage, and become key beds in Aso area. In the course of this study we found olivine-rich tephra between ACP4 and ACP3 (We call this as ACP3/4 scoria). In this study, we analyzed minerals, melt inclusions contained in tephra minerals, and volcanic glasses contained in ACP4, ACP3/4 scoria, ACP3, and ACP2 in order to compare with their result with ACP1 (Brouillet et al., 2018), Holocene scoria (Kishimadake, Ojodake, Kamikomezuka, and Nakadake) (Kawaguchi, 2018, personal communications), Aso-3 and Aso-4 (Kaneko et al., 2007, 2015), and deduce magma plumbing system of post-caldera stage of Aso volcano. The peak plagioclase composition contained in ACP4 ~ ACP1 is An# = 60~70, which is different from that of Aso-3 and Aso-4. The composition of melt inclusions in ACP2 and ACP4 does not change irrespective of host minerals and is almost the same as that of matrix glass. On the other hand, melt inclusions in ACP3/4 scoria show different compositions depending on host minerals. The composition of melt inclusions in ACP3 pyroxene is completely different from matrix glass. The maximum water content of melt inclusions in ACP4, ACP3/4 scoria, ACP2 is 1.3 wt.%, 3.8 wt.%, 3.0 wt.%, respectively. The P-T conditions of magma reservoirs of ACP2 and ACP4 are estimated as ACP2 : 890 ~ 920 ℃, 2 kbar, ACP4 : 900 ~ 920 ℃ (P = 2 kbar) from the composition of minerals and melt inclusions, and water content of melt inclusions.

Keywords: Aso volcano, Melt inclusion, FT-IR

