

## Bulk water content and hydration of pyroclasts of Asama volcano

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Pre-eruptive andesitic magmas generally contain several weight percent of water, which may vesiculate and degass during eruption. Water content of pyroclasts may bear information of quenching condition of magmas during eruption as well as hydration after the emplacement. We analyzed water contents of pyroclasts of Asama volcano using Karl-Fischer titration method. The age of eruption of the analyzed samples ranges from 20 ka, 13ka, A.D.1108 and A.D.1783. We sieved the sample, selected 4-8 mm clast, split it into two fragments; one used for KFT analyses, and the other half mounted in resin and polished for BSE image and EPMA analyses of glass. Step heating of samples showed 18-35wt% degassing from 0 to 50 C, and gradual degassing up to 500-700 C. Two old samples (Shiraitonotaki pumice fall and Komoro pyroclastic flow) showed ca.50wt% degassing between 200 and 400 C. Totally 159 samples were analyzed by KFT titration. Average water content, standard deviation and number of analyzed samples are 2.60wt%, 0.38, 3 for 20ka (Shiraitonotaki PFa), 2.92, 0.79, 9 for 13ka Tsumagoi PFa, 2.19, 0.51, 27 for 13ka Komoro PFI, 0.50, 0.56, 68 for A.D.1108 Tennin PFa, 0.59, 0.21, 9 for A.D. 1108 Oiwake PFI, 0.46, 0.09, 32 for A.D.1783 Tenmei PFa, 0.65, 0.38, 11 for A.D. 1783 Agatsuma PFI. Even some of the younger eruption products showed higher (>1.0 wt%) water contents. SiO<sub>2</sub> contents of matrix glass are 70-71 wt% for 20 ka Shiraitonotaki PFa, 68-77 wt% for 13ka Tsumagoi PFa, 68-80 wt% for 13ka Komoro PFI, 70-77 wt% and 63-67 wt% for A.D.1108 (Tennin PFa and Oiwake PFI, respectively), and 68-72 and 60-73 wt% for A.D.1783 (Tenmei PFa and Agatsuma PFI). There is no correlation between bulk water content and glass SiO<sub>2</sub> wt.%. Back scattered electron images of older pyroclasts show brighter glass with darker glass margin of several tens of microns thick. It is inferred that hydration affected the bulk water content of pyroclasts older than 10ka, and limited to those of pyroclasts younger than 1000 years in Asama volcano. Present analyses showed older ejecta (>13000 yrs) have higher bulk water content (average,2.2-2.9wt%) than younger ejecta (<1000 yrs)(average,0.46-0.65 wt%), and bulk water contents are not correlated with mode of eruption, magnitude of eruption, and SiO<sub>2</sub> content of glass, suggesting that hydration of glass is extensive for older samples (>10000 yrs) and limited for younger samples (<1000 yrs).

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