

U-Th Dating of Zircons from Unzen Volcanic Rocks

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Uranium disequilibrium dating was applied to zircons separated from the Unzen volcanic rocks to estimate zircon crystallization ages, which are further considered to understand magma chamber behaviour. ^{238}U and ^{230}Th concentrations were estimated using the LA-ICP-MS system at Kanazawa University with NIST610 glass as an external standard and ^{29}Si as an internal standard. Initial incorporation of ^{230}Th into a crystal was estimated based on the ^{238}U concentration of the dated zircon and $^{232}\text{Th}/^{238}\text{U}$ ratios of zircon and volcanic glassy groundmass. Several laser ablation settings are tested to gain ^{230}Th signal intensity, which concentration is small in quantity. To convert signal intensity to isotope concentration, integrated signal method is applied instead of mean count rate method. Based on obtained isotope concentrations, grain-by-grain crystallization ages were calculated.

Age histogram and spectrum of each sample are compared to ages of eruption and volcanic activity. In lava samples, age spectrum shows single peak distribution and the age of peak agrees with the period of volcanic activity. In the pyroclastic flow samples, there are several peaks older than period of volcanic activity.