

Crystal cannibalization: Youngest Toba Tuff remnants remobilized through post-caldera lava domes

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Crystal ages for crystal-rich rhyolitic lava domes that erupted in the wake of the enormous (>2800 km³), 74 ka Youngest Toba Tuff (YTT) eruption in Indonesia reveal an enigmatic geologic and petrologic story. The domes erupted along faults associated with the resurgent uplift of Samosir Island that was in progress at 30 ka [1]. Sanidine ⁴⁰Ar/³⁹Ar dates, however, suggest a YTT eruption age for the lava domes [2]. In order to investigate magma evolution in the interval between the YTT and rhyolite dome eruptions, we obtained ²³⁸U-²³⁰Th disequilibrium dates for dome zircon and allanite rims. SIMS analyses were performed on unpolished rims, as well as sectioned allanite containing untruncated near-rim zoning and adhering glass. Model ages show an absence of detectable <74 ka zircon and allanite growth and rather closely mimic those of YTT crystal rims [3], thus suggesting the domes may be remobilized remnant YTT magma. Zircon and allanite rim growth near 74 ka for both the YTT and domes is also insignificant. Either dome zircon and allanite were dominantly isolated from melt, or magma conditions were unfavorable for their crystallization. The frequent occurrence of zircon and allanite within crystal clots or other minerals may, for example, have precluded younger growth; and intensely resorbed quartz with bright CL rims and allanite resorption textures may support a reheating event prior to lava dome eruption. Efforts to establish the relations between crystallization, magma mobilization, and eruption are continuing.

[1] Chesner *et al* (2013) *AGU abs.* **V33A-2833**. [2] Chesner *et al* (2000) *GSA abs.* **3**, **502**. [3] Vazquez and Reid (2004) *Science* **305**, 991-994 unpublished data.