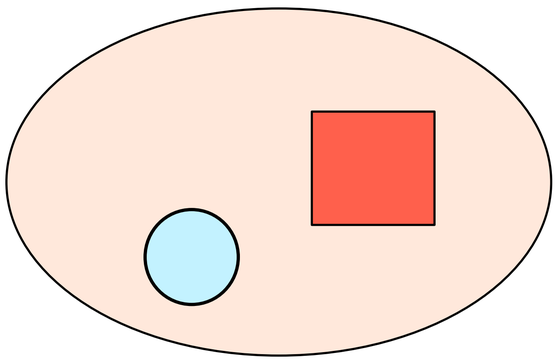
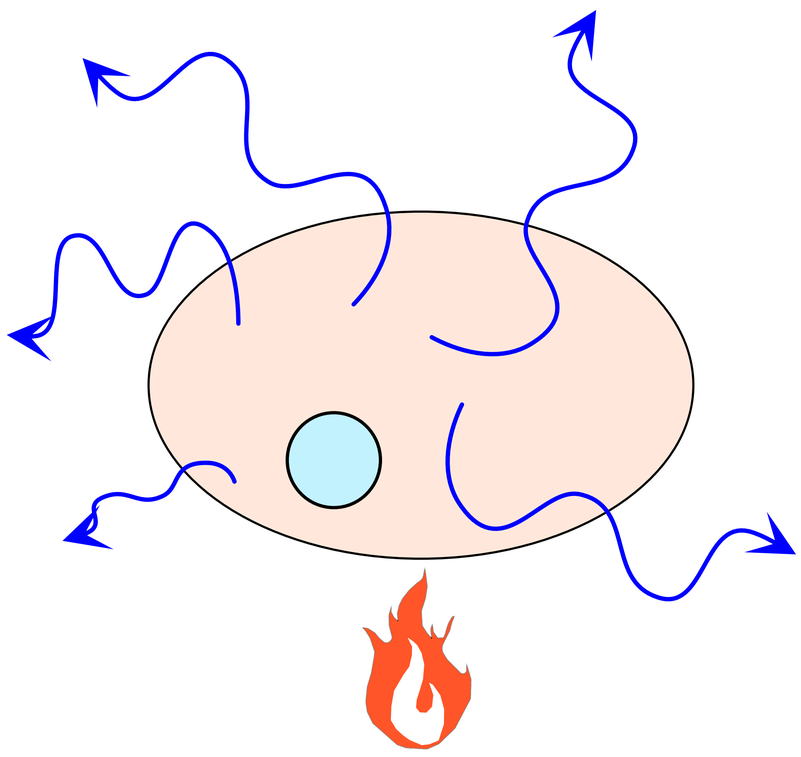
H_2O restoration



Step I: SIMS analysis of glasses of MI

The starting H_2O contents of the MI studied to be corrected is the H_2O concentration of the glass. The the H_2O concentration of the glass was based on SIMS analysis.

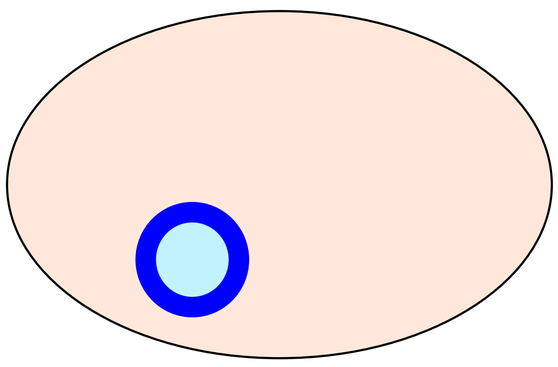
+



Step II: addition of H_2O lost by heating experiments

H_2O-loss during heating experiments. This correction is applied to all MI studied. H_2O loss estimated based on Eq. 12 by Qin et al. (1992). We provided a visual basic code in Appendix file A7 to calculate H_2O loss based on coefficient, D, radius of MI and its host, and densities of melt and host.

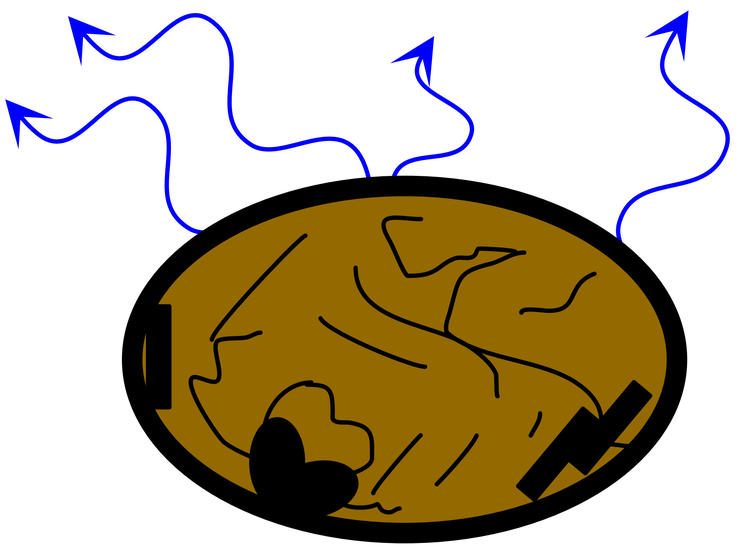
+



Step III: addition of H_2O contained in the bubble

H_2O content loss into the bubble lining as liquid H_2O. This correction is based on Raman signals of liquid H_2O or gypsum reported by Esposito et al. (2016), and based on the composition of the fluid estimated using MafiCH solubility model and the composition of the glass of the bubble-bearing MI. This correction is applied to all bubble-bearing MI.

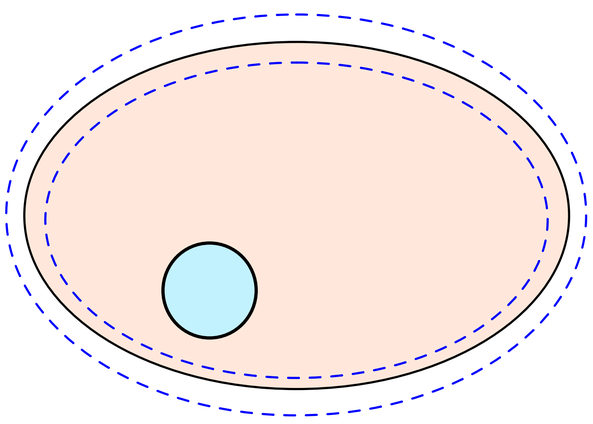
+



Step IV: addition of H_2O lost by post-eruption cooling

H_2O-loss during natural post eruption cooling of lavas. Correction applied only to the 5 MI hosted in olivine from lavas (sample Somma Caldera >33 ka). H_2O-loss is calculated based on the comparison between MI hosted in olivine from lava with those hosted in olivine from pumice lapilli.

±



Step V: addition-subtraction of H_2O by PEC

H_2O adjustment based on estimated PEC. This correction is applied to all MI studied. When PEC is positive (olivine added back to the melt), the H_2O is subtracted to the H_2O of the melt calculated after the previous steps. When the PEC is negative (olivine subtracted from the melt), the H_2O is added to the H_2O of the melt calculated after the previous steps.