

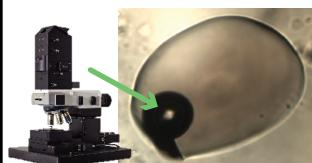
Common workflows for volatile-based inclusion barometry in volcanology

Common steps
to both methods

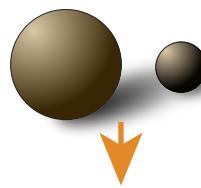
- 1) Collect rapidly quenched tephra + spatter
- 2) Transport sample to laboratory
- 3) Wash/sieve + pick minerals
- 4) Mount, Polish and Identify **melt inclusions** or **fluid inclusions**

Melt inclusion workflow

- 5) Bubble CO₂ by Raman



- 6) Relative volumes by μCT or microscopy



- 8) Glass H,C by FTIR/SIMS

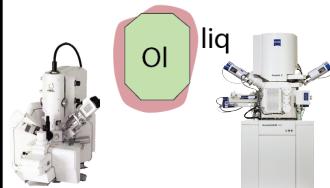


- 7) Polish to expose melt inclusion (single for SIMS, double for FTIR)

- 10) Post-entrapment crystallisation correction

H+C+Majors

- 9) Glass + mineral chem. by EMPA/SEM

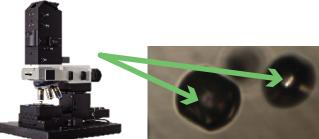


- 11) Calculate saturation P via solubility model

Fluid inclusion workflow

- 5) Measure inclusion CO₂ density

by Raman

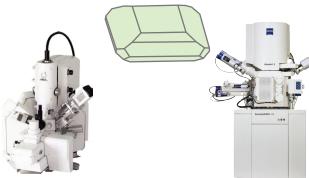


OR by Microthermometry



ρ_{CO_2}

- 6) Mineral chemistry (for T) by EMPA/SEM →



- 7) Calculate entrapment P via equation of state

ρ_{CO_2} and T → P

(12, 8) Calculate entrapment depth from P via crustal density model (i.e. $\rho_{crust} = 2400 \text{ kg/m}^3$ in Wieser *et al.*, 2021)

(13, 9) Construct magma plumbing system model