Supplementary Figures

Rapid magma generation or shared magmatic reservoir? Petrology and geochronology of the Rat Creek and Nelson Mountain Tuffs, CO, USA

Sliwinski, JT; Farsky, DH; Lipman, PW; Guillong, M; Bachmann, O

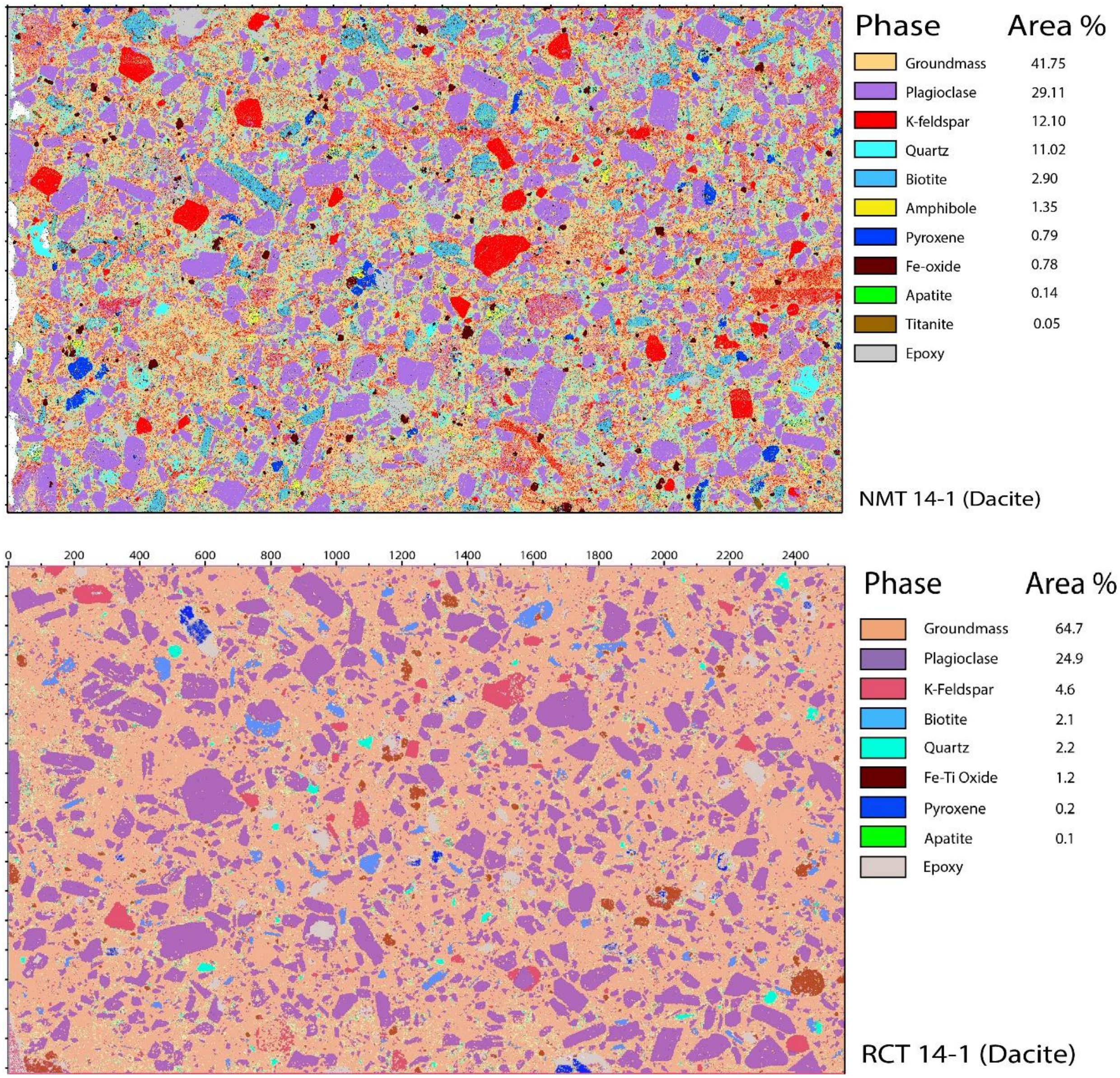


Fig. S1*: iSpectra phase map (Liebske 2015) of the NMT dacite (Tnd, top) and RCT dacite (Trd, bottom) from a full petrographic thin section (approx. 3 x 2 cm), demonstrating typical abundances of mineral phases in both the NMT and RCT.*

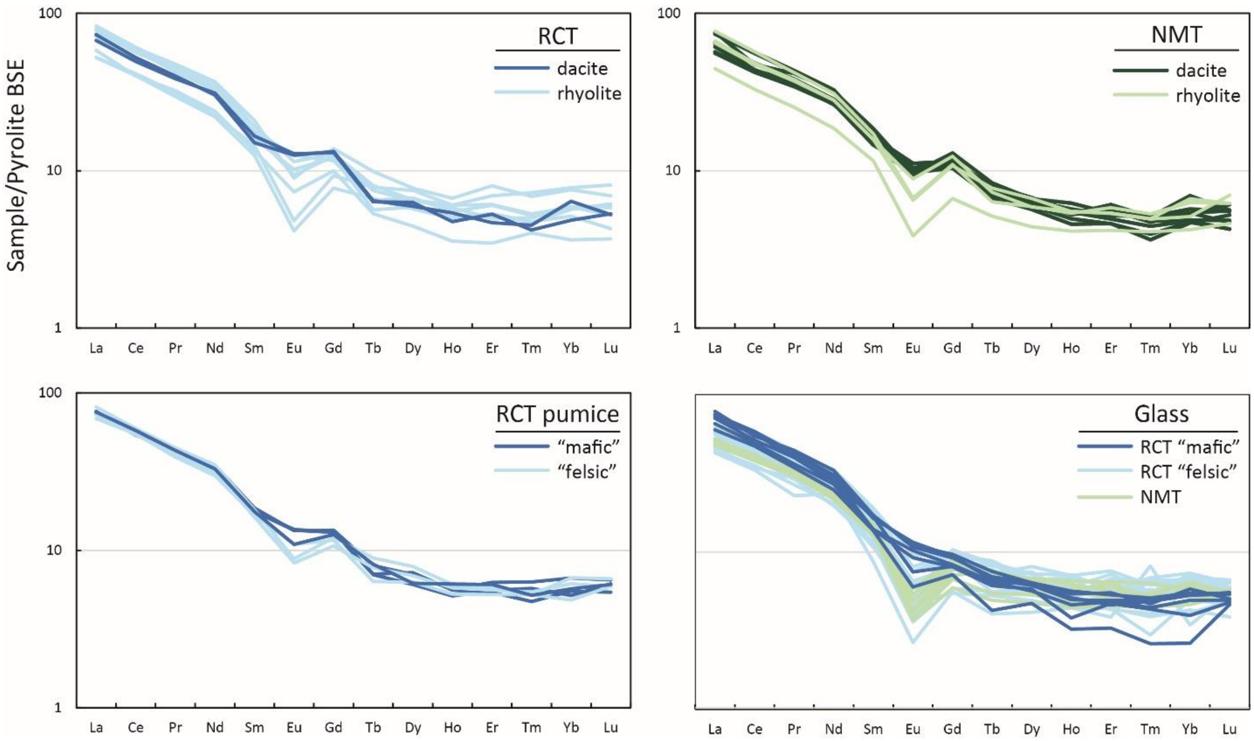


Fig. S2*: REE chemistry for RCT and NMT units from this study (normalized to pyrolite model; see McDonough and Sun (1995)). Bottom right: glass analyses from RCT and NMT.*

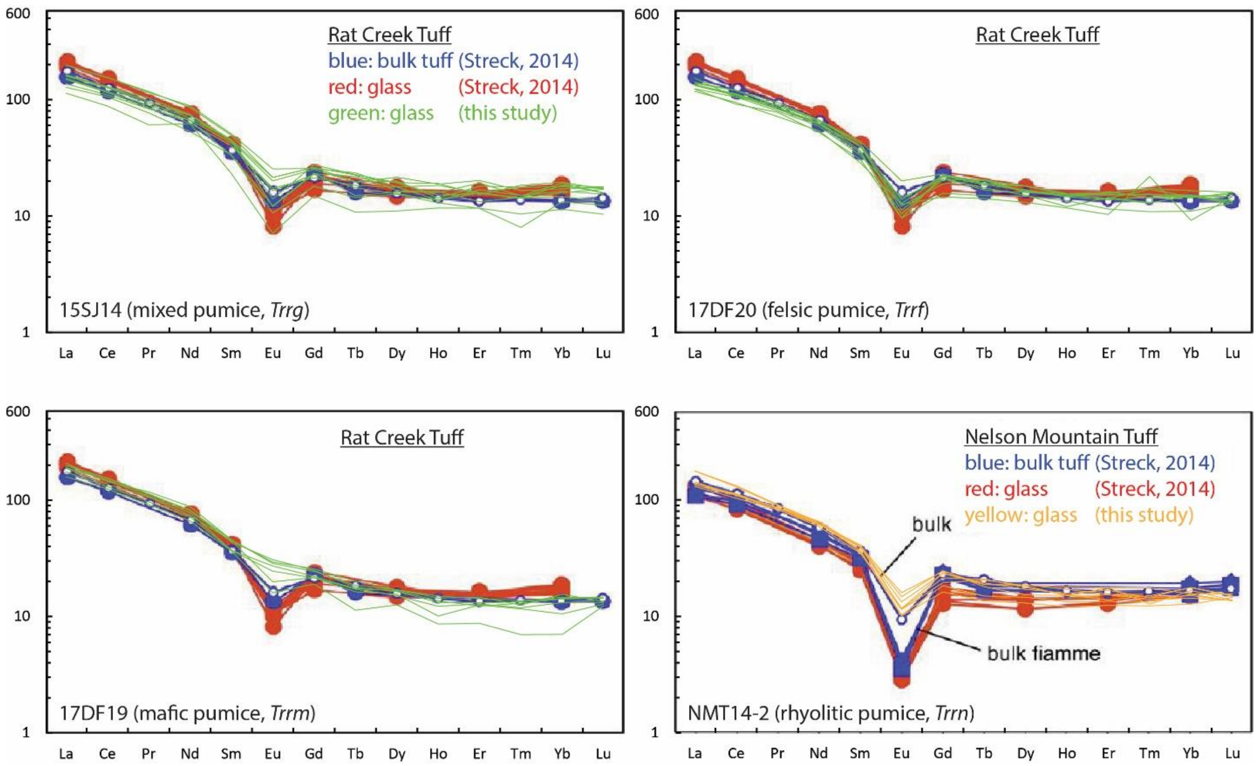


Fig. S3: *REE concentrations (normalized to C1 chondrite, (McDonough and Sun 1995)) for RCT and NMT glass compared to published values from (Streck 2014).*

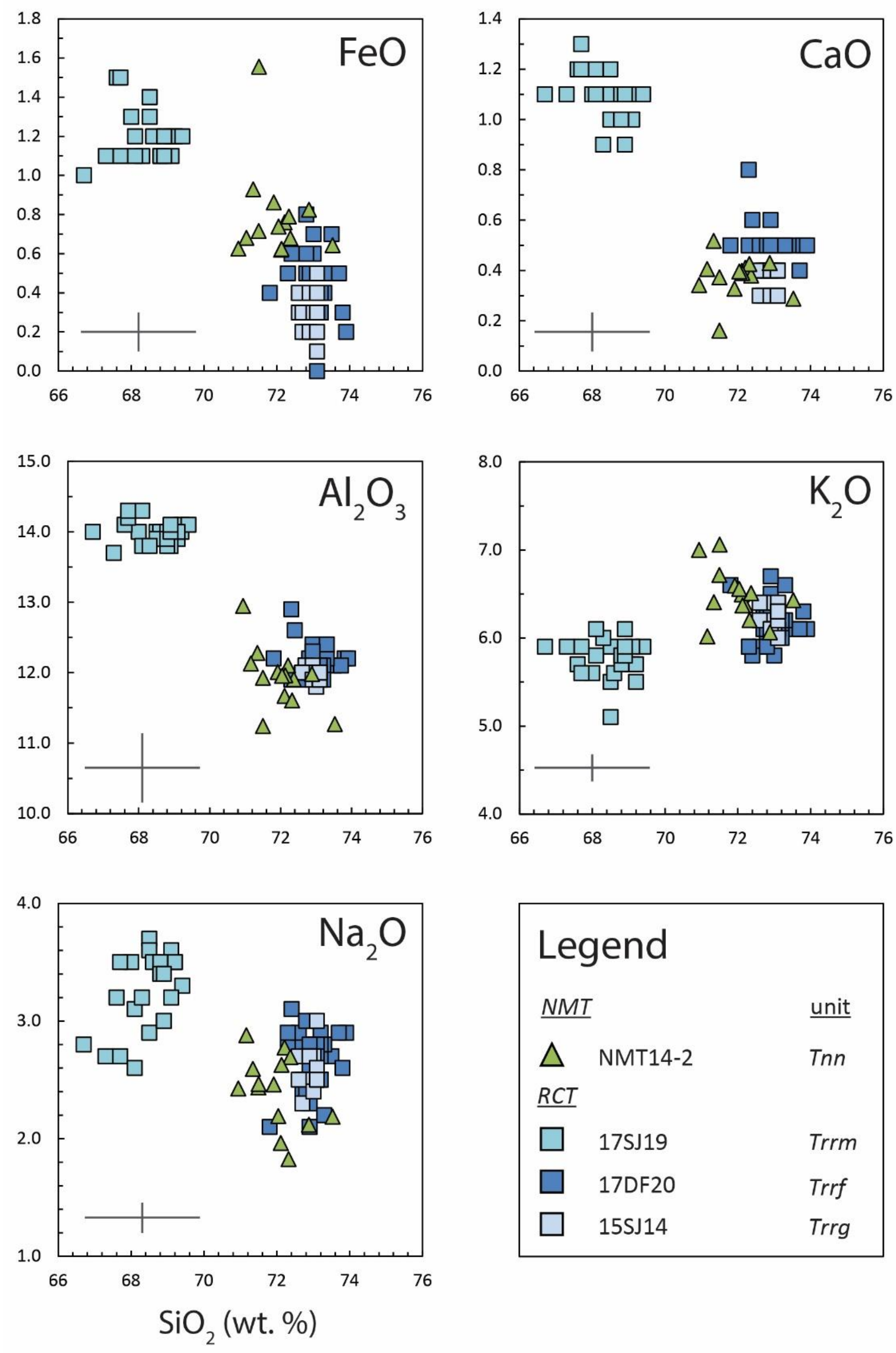


Fig. S4: *Major and trace element variations in RCT and NMT glass, obtained by EDS and LA-ICP-MS, respectively. Error bars denote 1s uncertainties, based on long-term reproducibility of validation reference materials.*

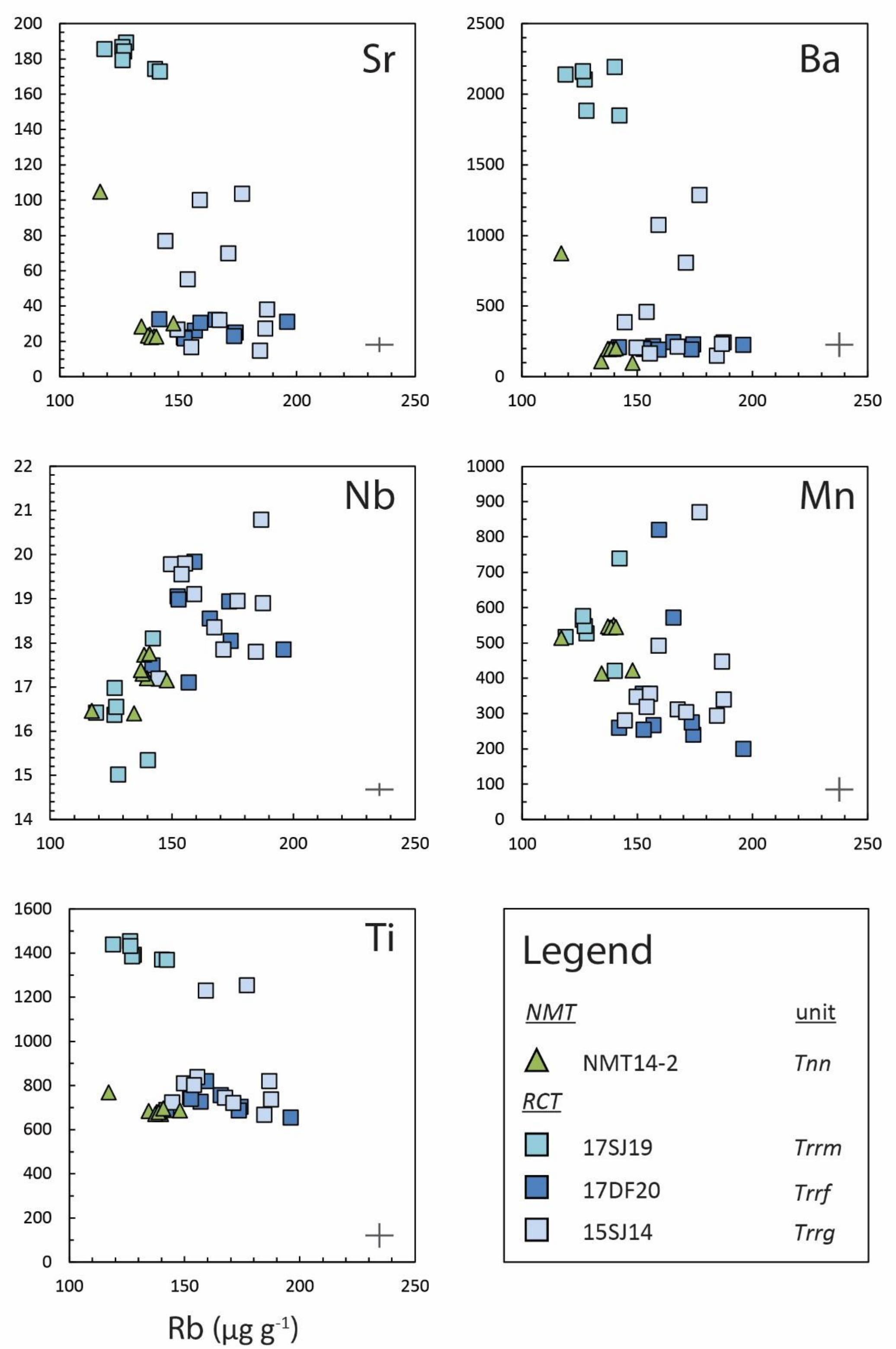


Fig. S4: *(continued)*

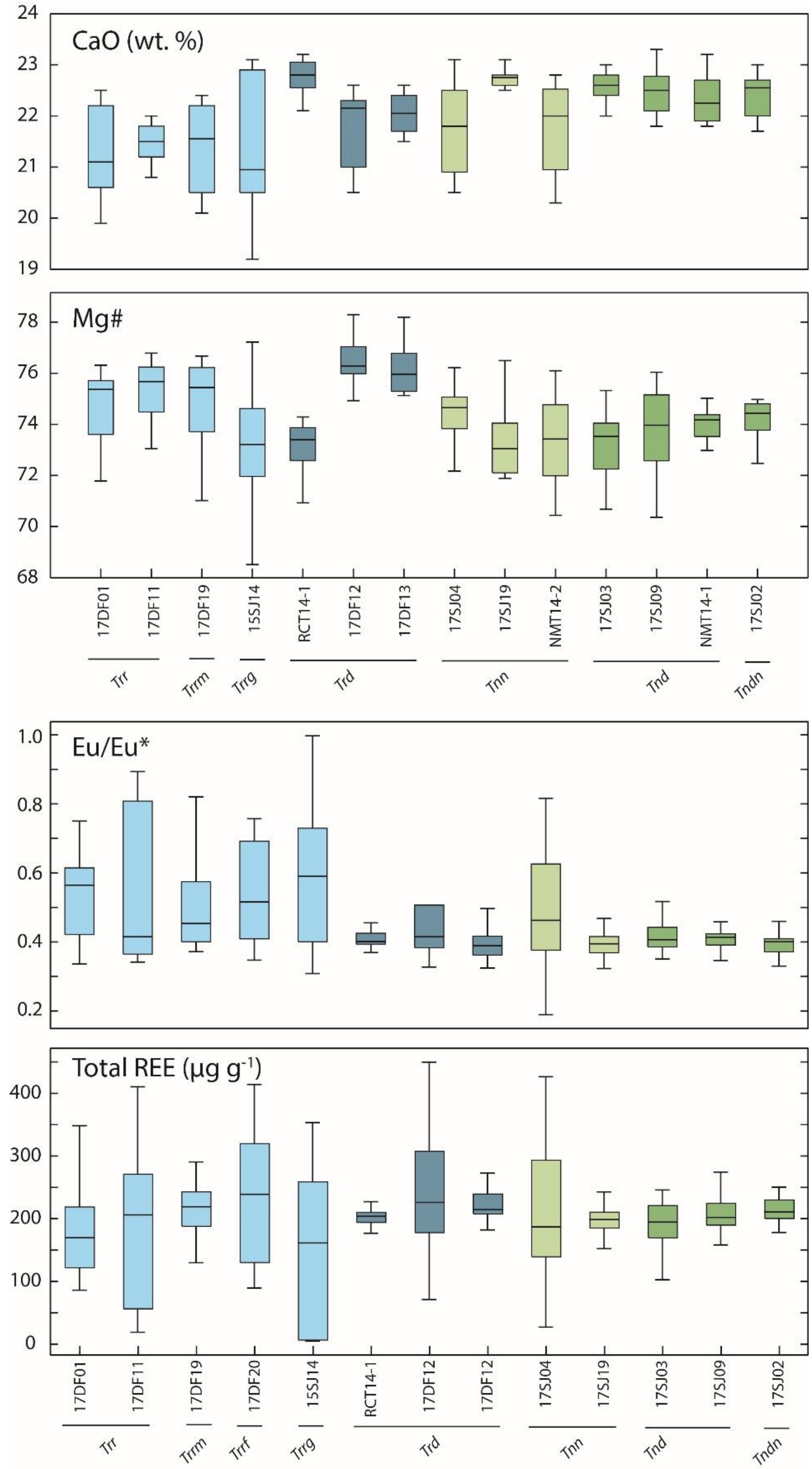


***Fig. S5**: Pyroxene major (CaO, wt. %, Mg#) and trace element (Eu/Eu*, total REE μg g^{-1}) compositions of the RCT and NMT. See Table 1 and Fig. 1 for unit descriptions.*

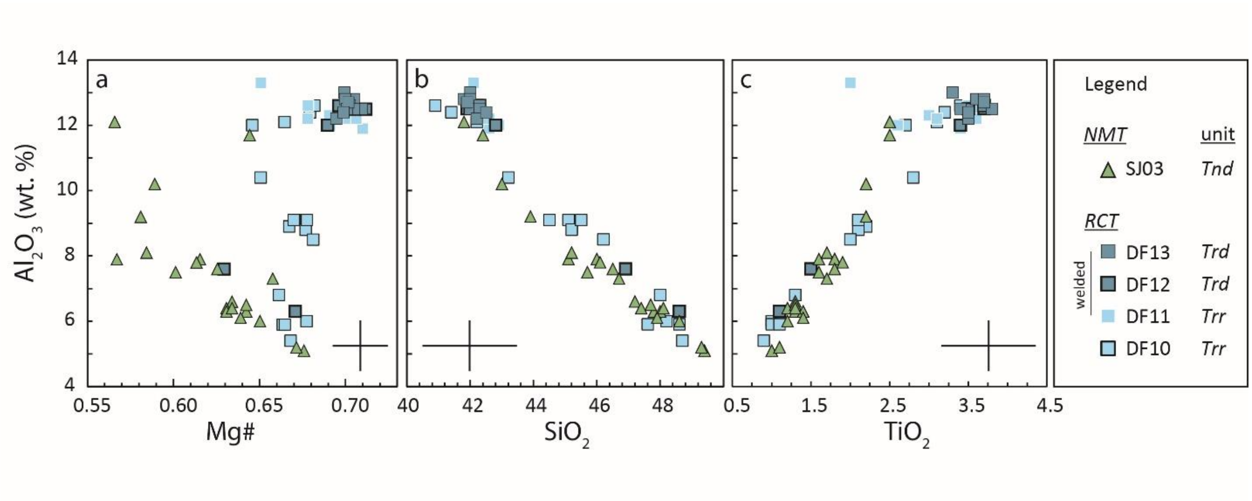


Fig. S6: *Amphibole compositions from the RCT and NMT, demonstrating variability in Al_2O_3 indicative of crystallization at variable pressures. SiO_2 and TiO_2 concentrations in wt. %; Mg# = Mg/(Mg+Fe) (molar). Error bars show conservative ~5% 2s uncertainty.*

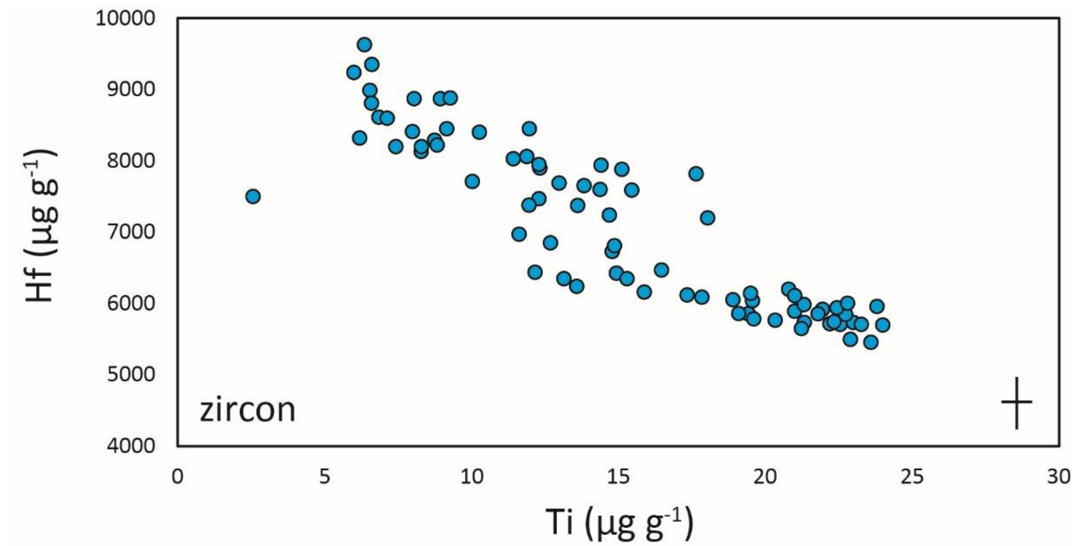


Fig. S7: *Hf vs Ti (µg g^{-1}) for select RCT zircons, demonstrating a pronounced correlation that validates the use of Hf as a temperature proxy. Error bars show conservative ~5% 2s uncertainty, based on long-term reproducibility of reference materials.*

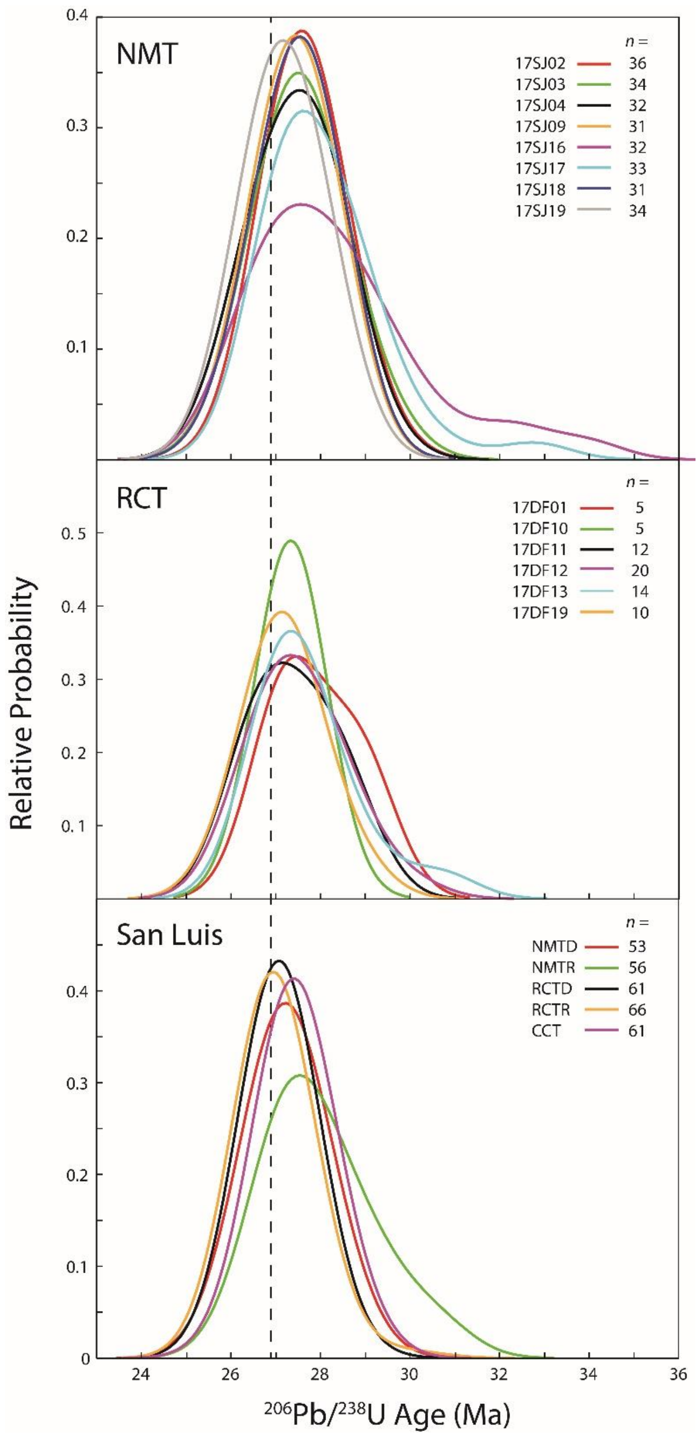


Fig. S8: *Zircon $^{206}Pb/^{238}U$ ages (Th disequilibrium-and alpha radiation dose-corrected) and $^{40}Ar/^{39}Ar$ eruption age (dashed line, calibrated to FCT = 28.02 Ma) from the San Luis Caldera, each panel representing samples analyzed in a single day: (top) probability density distributions of 8 NMT samples, demonstrating internal age consistency; (middle) 6 samples from the RCT, likewise showing internal consistency; (bottom) comparison of NMTR, NMTD, RCTR, RCTD and CCT ages, showing broad similarity between population and consistency with the eruption age.*

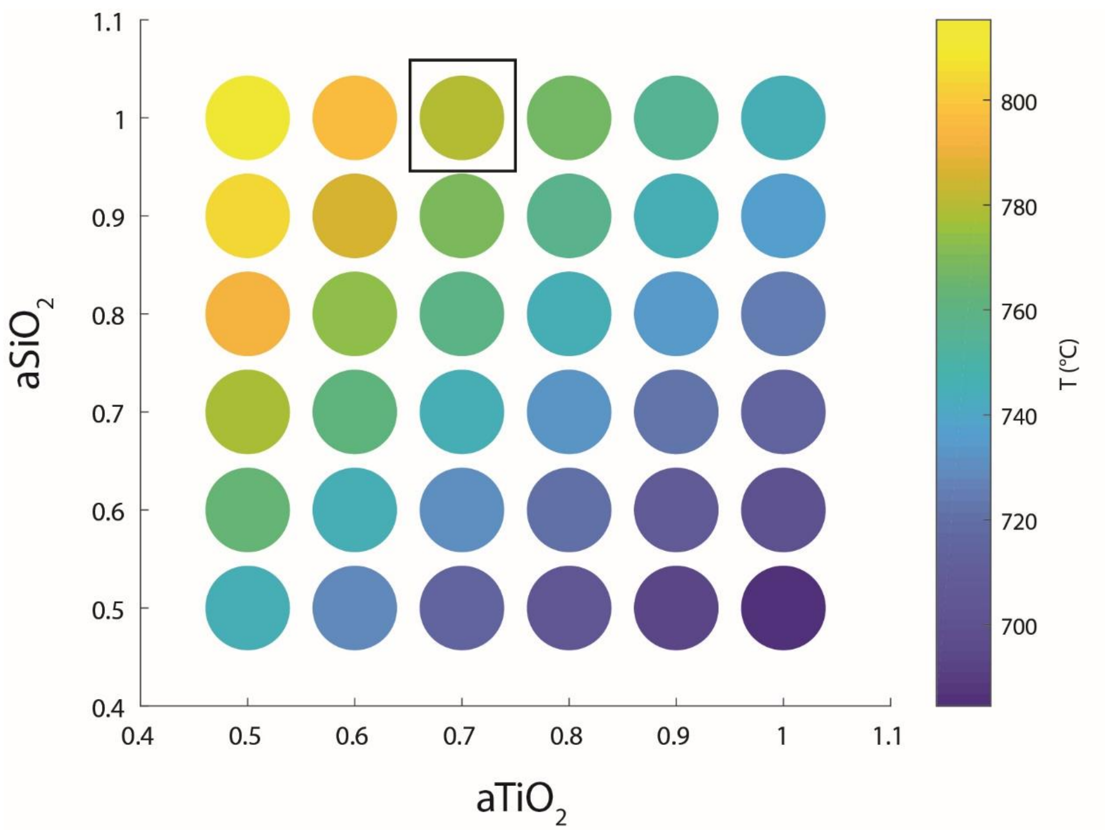
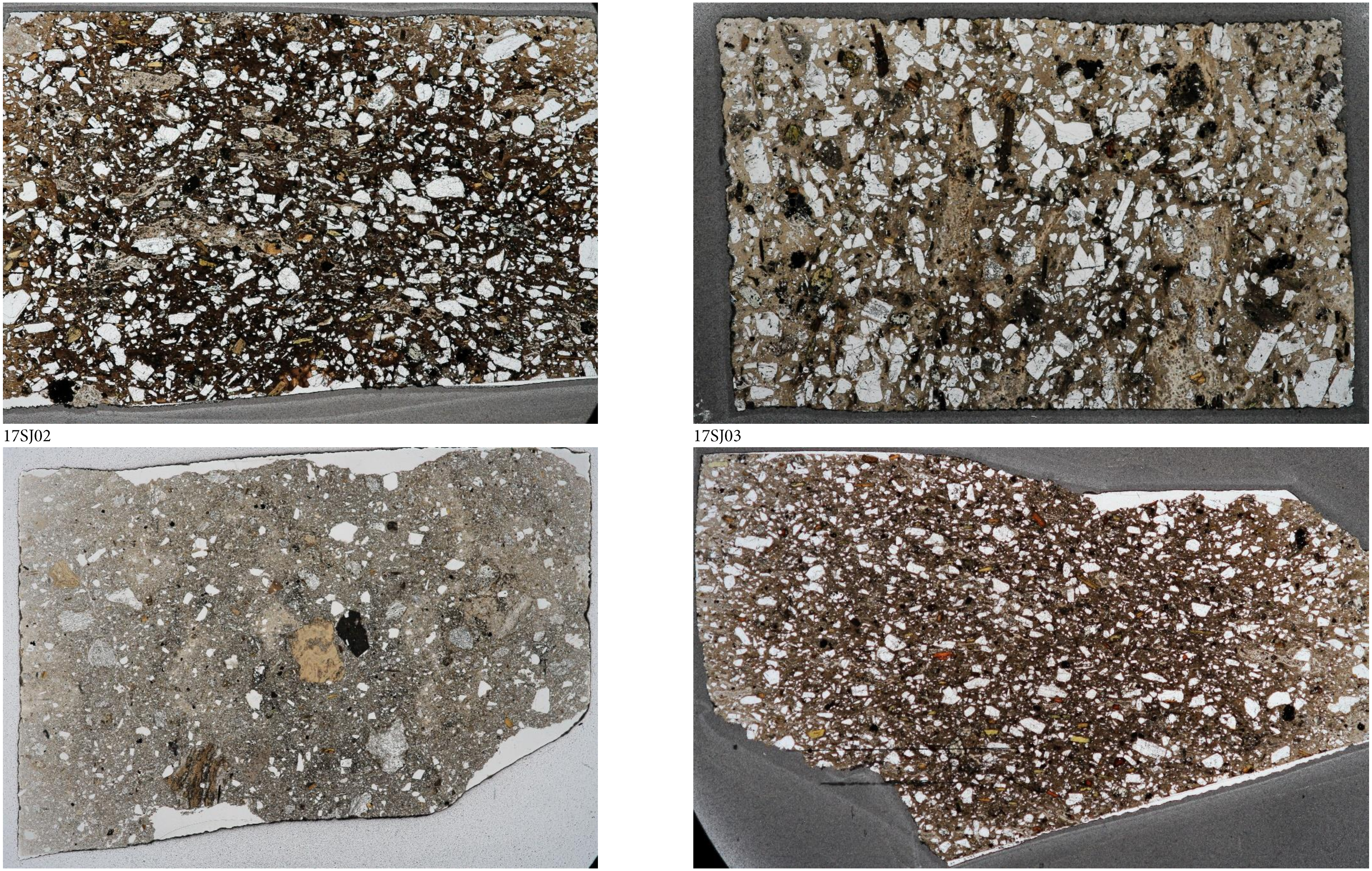


Fig. S9: *Ti-in-zircon temperatures at variable a_{TiO2} and a_{SiO2}, using a Ti concentration of 10 µg g^{-1}. The black square denotes the conditions used in this study. Model based on (Ferry and Watson 2007), where:*

$$T\ (°C) = -4800 / [\log(Ti\ ppm) - 5.711 - \log(a_{TiO2}) + \log(a_{SiO2})] - 273.15$$



17SJ02

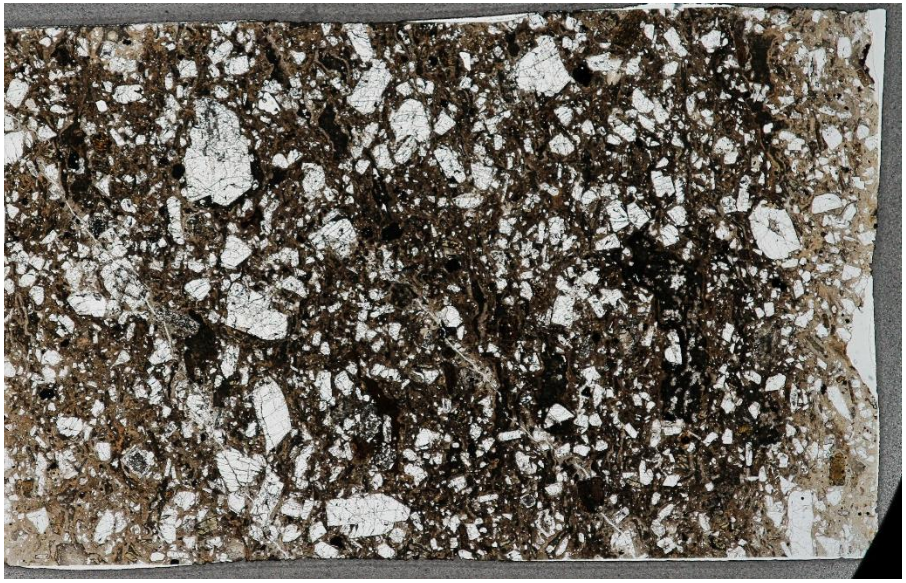
17SJ03

17SJ04

17SJ09

Fig. S10: *Petrographic thin sections of NMT and RCT bulk tuff and pumice samples (plain polarized light) on standard glass slides (25x75 mm).*

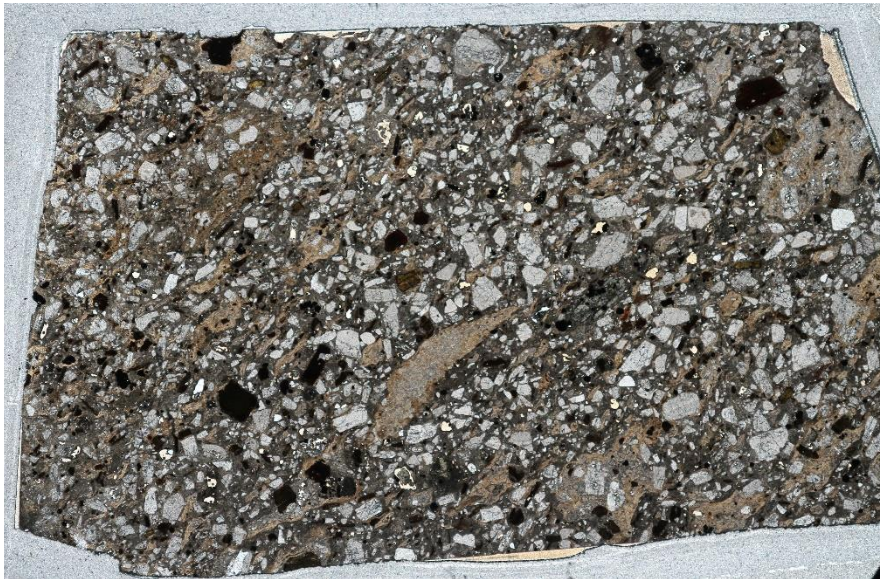

17SJ17


17SJ18

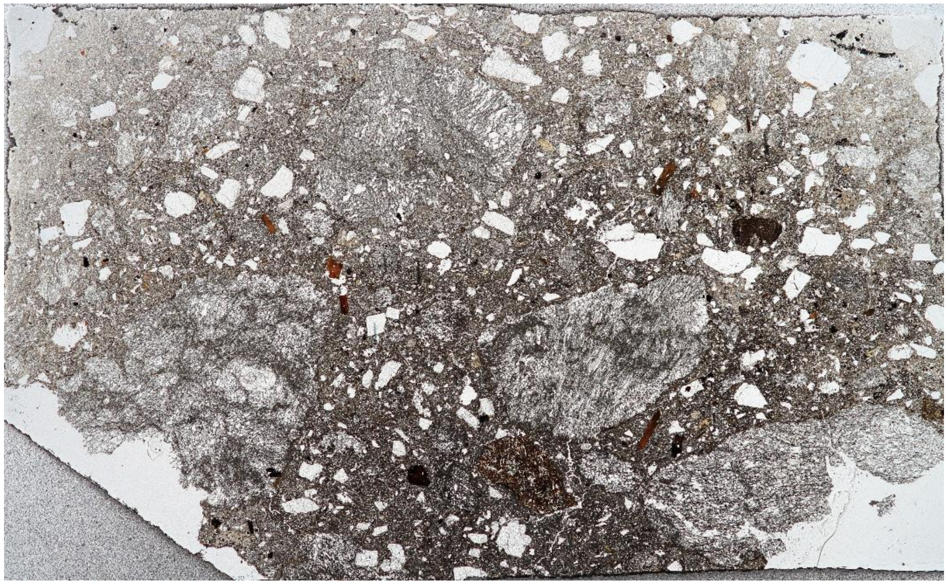

NMT14-1


NMT14-2

Fig. S10: *(continued)*



RCT14-1



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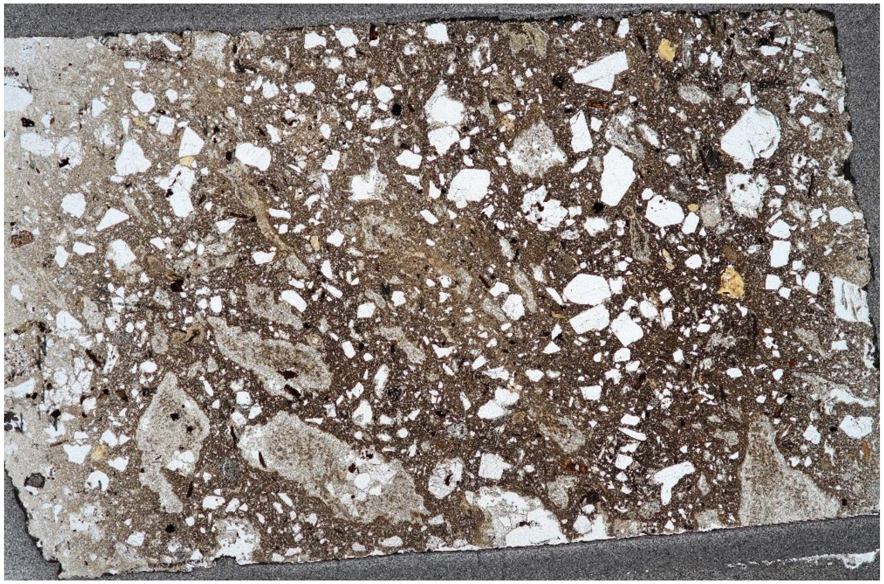

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17DF12

Fig. S10: *(continued)*


17DF13


17DF21

Fig. S10: *(continued)*

References

Ferry J, Watson E (2007) New thermodynamic models and revised calibrations for the Ti-in-zircon and Zr-in-rutile thermometers. Contrib Mineral Petrol 154(4):429-437 doi:10.1007/s00410-007-0201-0

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