AGU PUBLICATIONS

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Supporting Information for

Compaction and permeability evolution of tuffs from Krafla volcano (Iceland)

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Additional Supporting Information (Files uploaded separately)

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Introduction

In the following, the grain size distributions (Figures S1, S2, and S3) and the X-ray powder diffraction data (Figures S4, S5, and S6) for each tuff (KT1, KT2, and KT3) are presented. The captions for the Data Sets are presented after Figures S1 to S6.

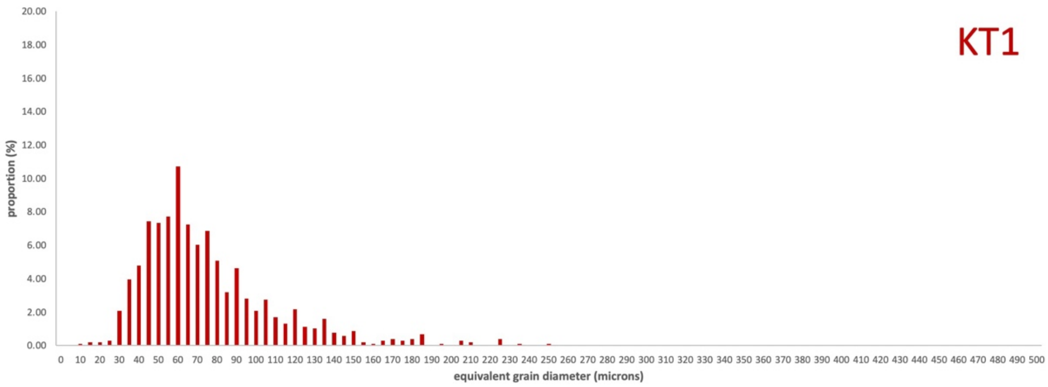

Figure S1. Grain size distribution for tuff KT1.

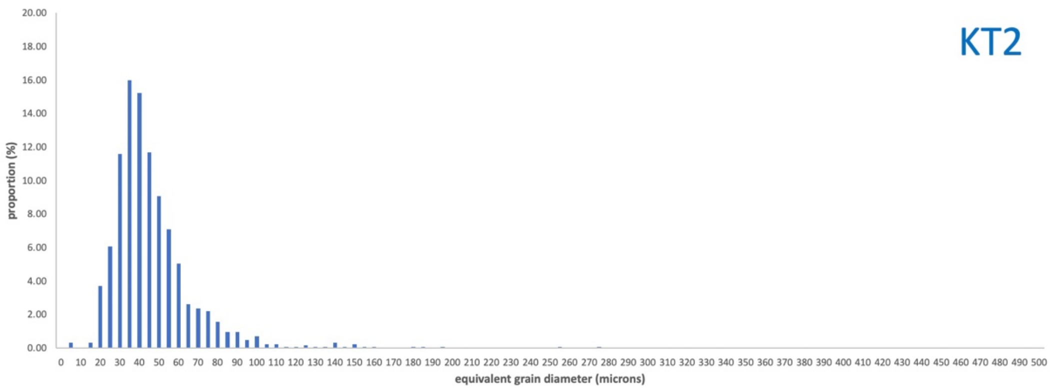

Figure S2. Grain size distribution for tuff KT2.

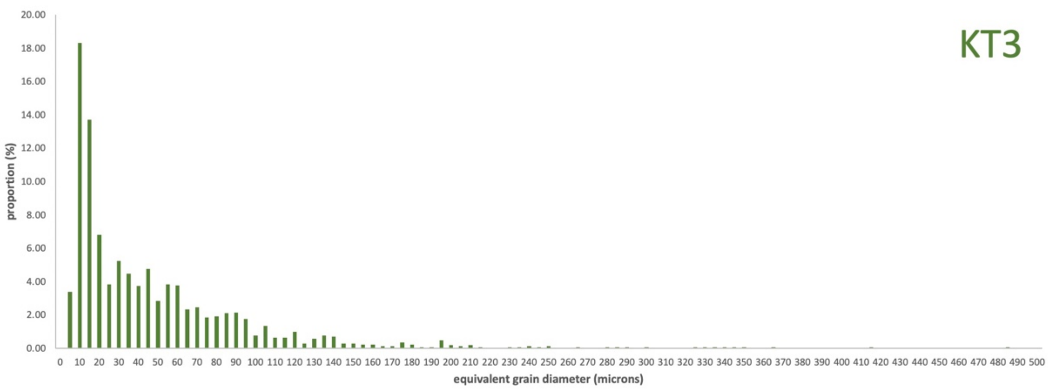

Figure S3. Grain size distribution for tuff KT3.

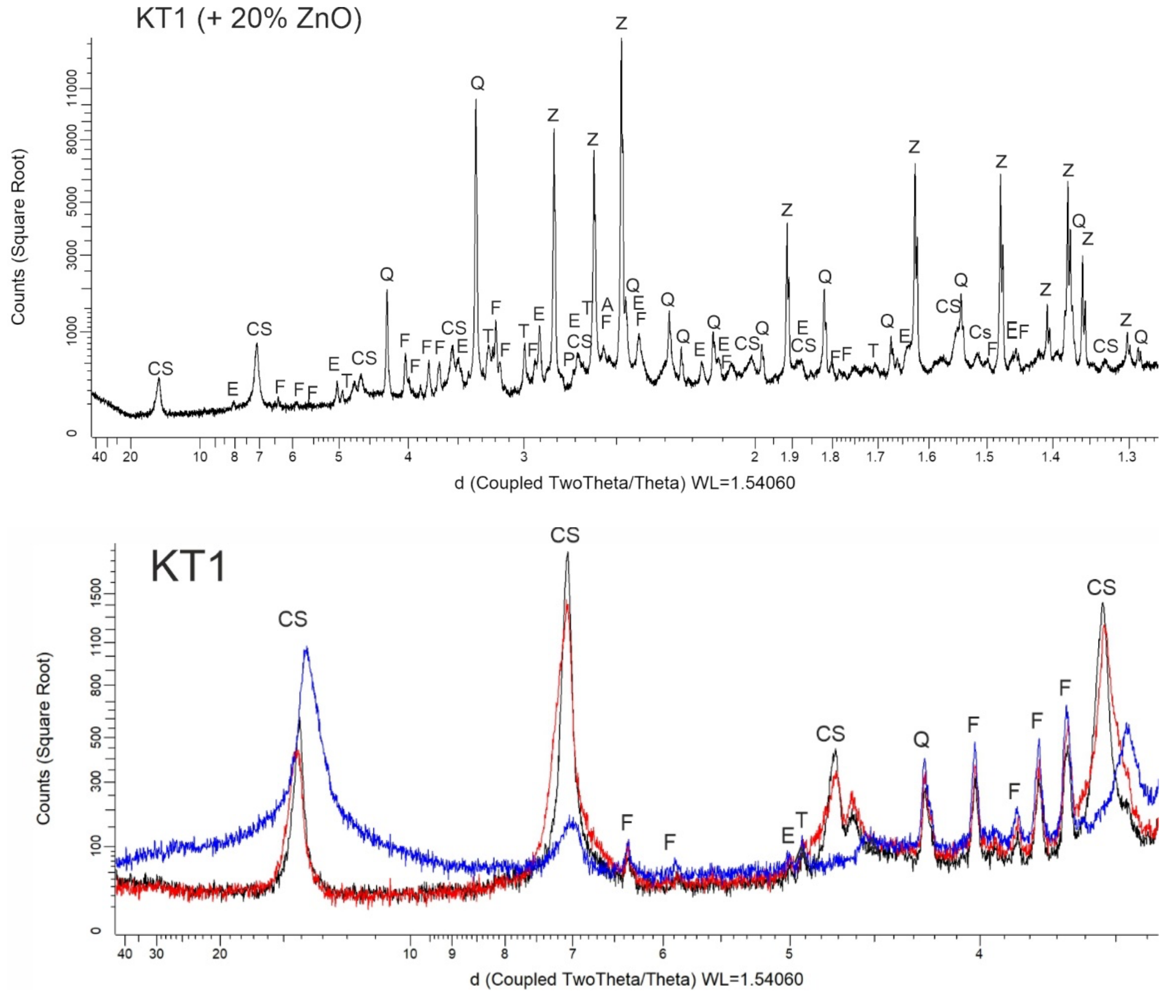

Figure S4. Top: X-ray pattern of non-oriented sample KT1 with 20 wt.% ZnO as internal standard. Bottom: X-ray pattern of oriented specimen of sample KT1 (black: air dried; red: ethylene-glycolated; blue heated to 550°C).

Mineral abbreviations: CS: chlorite-smectite, E: epidote, F: feldspars, P: pyrite, Q: quartz, T: titanite; Z: ZnO

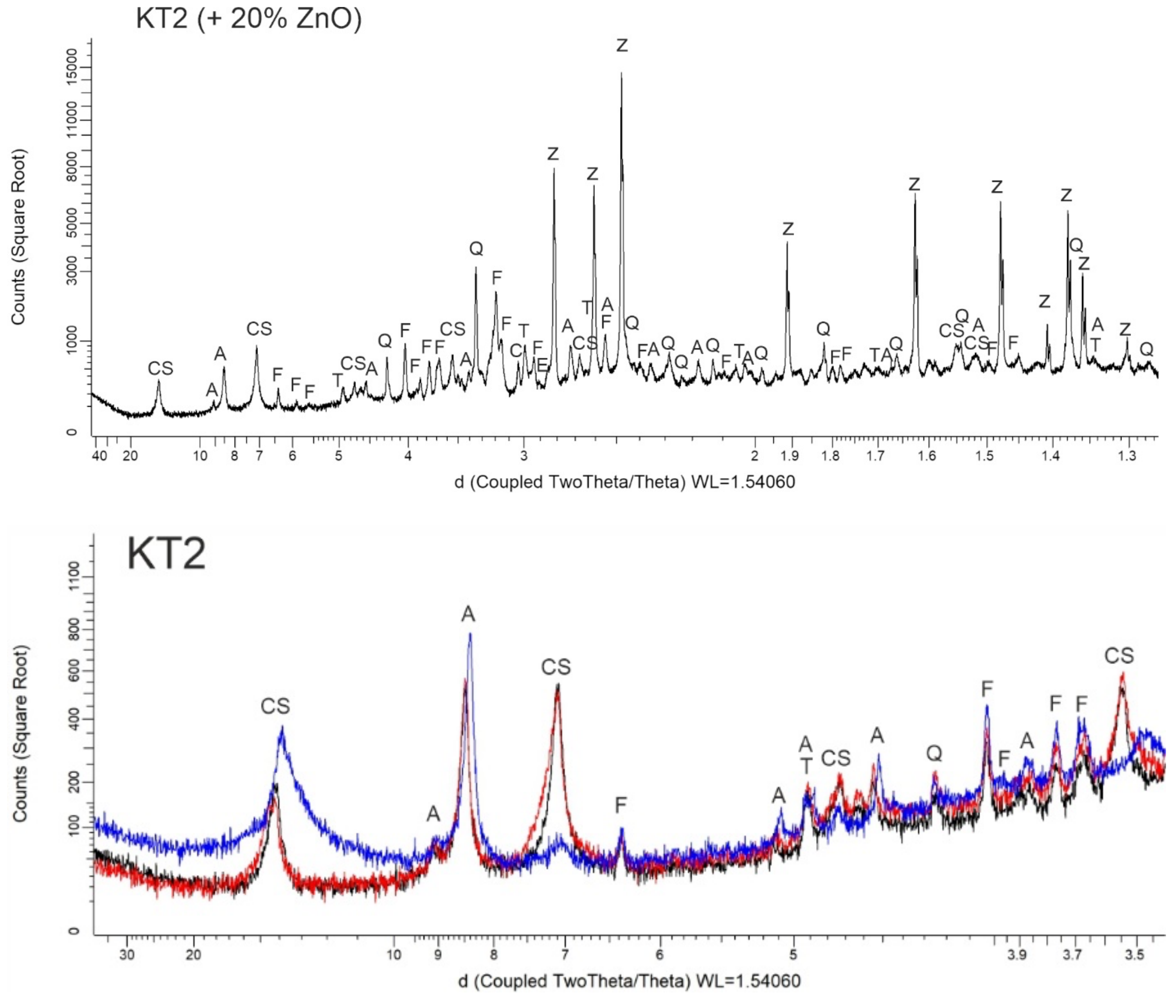

Figure S5. Top: X-ray pattern of non-oriented sample KT2 with 20 wt.% ZnO as internal standard. Bottom: X-ray pattern of oriented specimen of sample KT2 (black: air dried; red: ethylene-glycolated; blue heated to 550°C).

Mineral abbreviations: A: actinolite, C: calcite, CS: chlorite-smectite, E: epidote, F: feldspars, Q: quartz, T: titanite; Z: ZnO

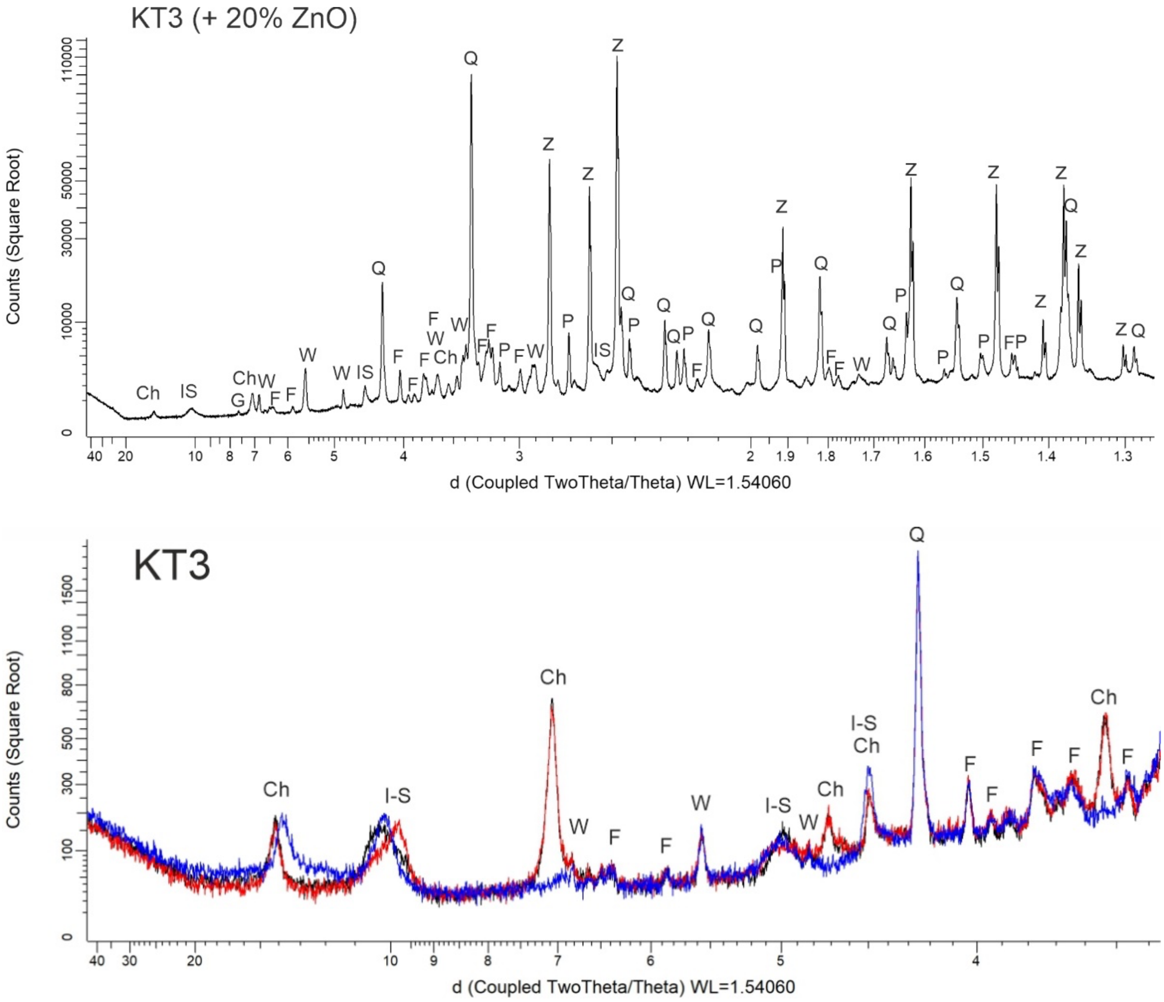

Figure S6. Top: X-ray pattern of non-oriented sample KT3 with 20 wt.% ZnO as internal standard. Bottom: X-ray pattern of oriented specimen of sample KT3 (black: air dried; red: ethylene-glycolated; blue heated to 550°C).

Mineral abbreviations: Ch: chlorite, E: epidote, F: feldspars, G: gypsum, IS: R3 illite-smectite, P: pyrite, Q: quartz, T: titanite; W: wairakite, Z: ZnO

Data Set S1. Grain size distributions (i.e., the data shown in Figures S1, S2, and S3) for each tuff (KT1, KT2, and KT3). Data Set name: ds01.

Data Set S2. Time and amplitude (Ampl) data (from the oscilloscope) for the waveforms used to calculate the P-wave velocity of KT1 during hydrostatic pressurization and depressurization (up to 60 MPa). Time, pore pressure difference (Pdiff), and mass of water data used to calculate the permeability of KT1 during hydrostatic pressurization and depressurization (up to 60 MPa). L - length; D - diameter; Pc - confining pressure; Vp - P-wave velocity; k - permeability. Data Set name: ds02.

Data Set S3. Time and amplitude (Ampl) data (from the oscilloscope) for the waveforms used to calculate the P-wave velocity of KT2 during hydrostatic pressurization and depressurization (up to 60 MPa). Time, pore pressure difference (Pdiff), and mass of water data used to calculate the permeability of KT2 during hydrostatic pressurization and depressurization (up to 60 MPa). L - length; D - diameter; Pc - confining pressure; Vp - P-wave velocity; k - permeability. Data Set name: ds03.

Data Set S4. Time and amplitude (Ampl) data (from the oscilloscope) for the waveforms used to calculate the P-wave velocity of KT3 during hydrostatic pressurization and depressurization (up to 60 MPa). Time, pore pressure difference (Pdiff), and mass of water data used to calculate the permeability of KT3 during hydrostatic pressurization and depressurization (up to 60 MPa). L - length; D - diameter; Pc - confining pressure; Vp - P-wave velocity; k - permeability. Data Set name: ds04.

Data Set S5. Mechanical data (differential stress, effective mean stress, axial strain, and porosity reduction) for the triaxial experiments performed on KT1 at different effective pressures. Data Set name: ds05.

Data Set S6. Mechanical data (differential stress, effective mean stress, axial strain, and porosity reduction) for the triaxial experiments performed on KT2 at different effective pressures. Data Set name: ds06.

Data Set S7. Mechanical data (differential stress, effective mean stress, axial strain, and porosity reduction) for the triaxial experiments performed on KT3 at different effective pressures. Data Set name: ds07.

Data Set S8. Data used to calculate permeability (time and the position of the pore pressure piston P5) and the mechanical data for a triaxial deformation experiment performed at EPFL (Lausanne, Switzerland) on sample EPFL_KT1_1. Data are available for pressurization, during deformation, and for depressurization.

Data Set S9. Data used to calculate permeability (time and the position of the pore pressure piston P5) and the mechanical data for a triaxial deformation experiment performed at EPFL (Lausanne, Switzerland) on sample EPFL_KT2_1. Data are available for pressurization, during deformation, and for depressurization.

Data Set S10. Data used to calculate permeability (time and the position of the pore pressure piston P5) and the mechanical data for a triaxial deformation experiment performed at EPFL

(Lausanne, Switzerland) on sample EPFL_KT3_1. Data are available for pressurization, during deformation, and for depressurization.

Data Set S11. Data used to calculate permeability (time and the position of the pore pressure piston P5) and the mechanical data for a triaxial deformation experiment performed at EPFL (Lausanne, Switzerland) on sample EPFL_KT3_3. Data are available for pressurization, during deformation, and for depressurization.