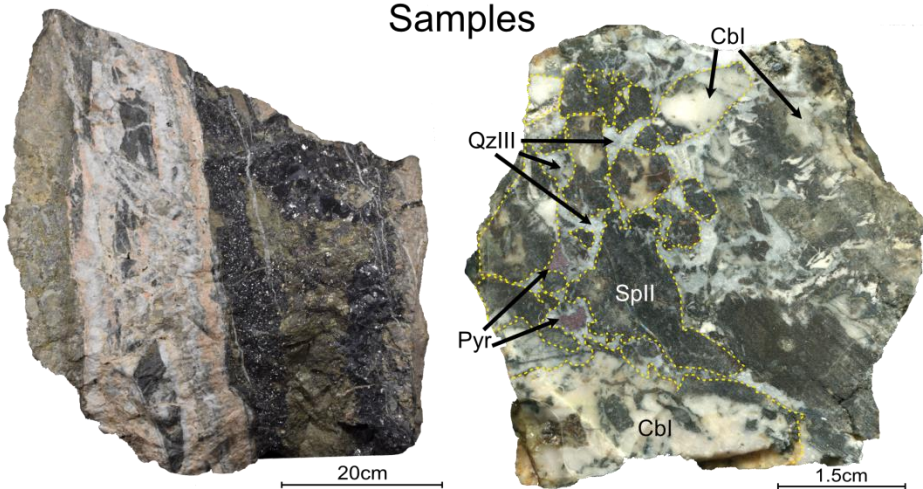


- Petrography
- Microthermometry
- Whole-rock geochemistry

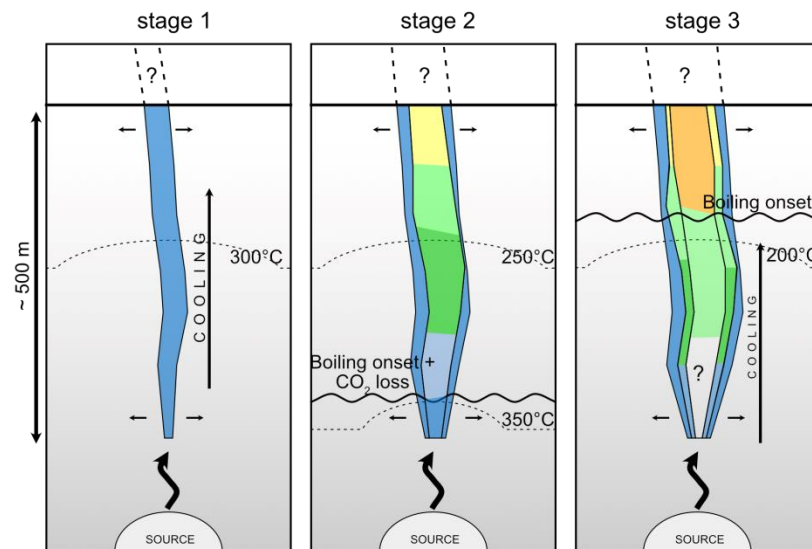
Samples



Mineral associations

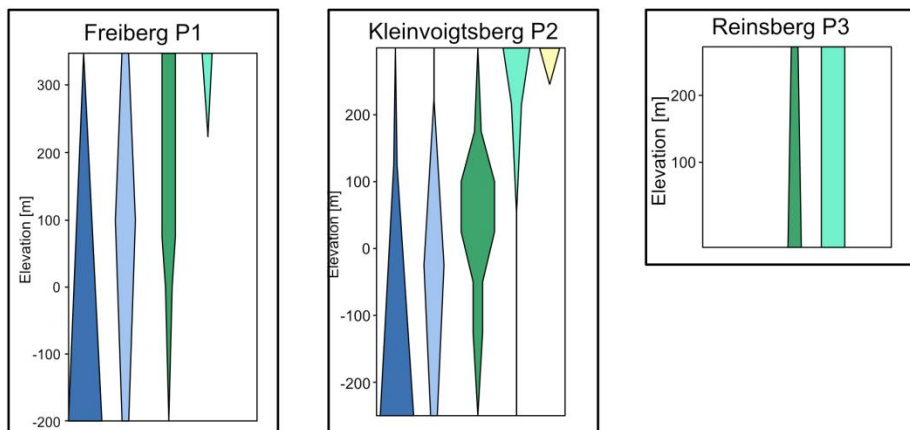


Model



- sphalerite-pyrite-quartz
- galena-quartz±carbonate
- sphalerite-Ag-sulfides-carbonate
- Ag-sulfides quartz
- stibnite-quartz
- quartz-carbonate

Vertical profiles

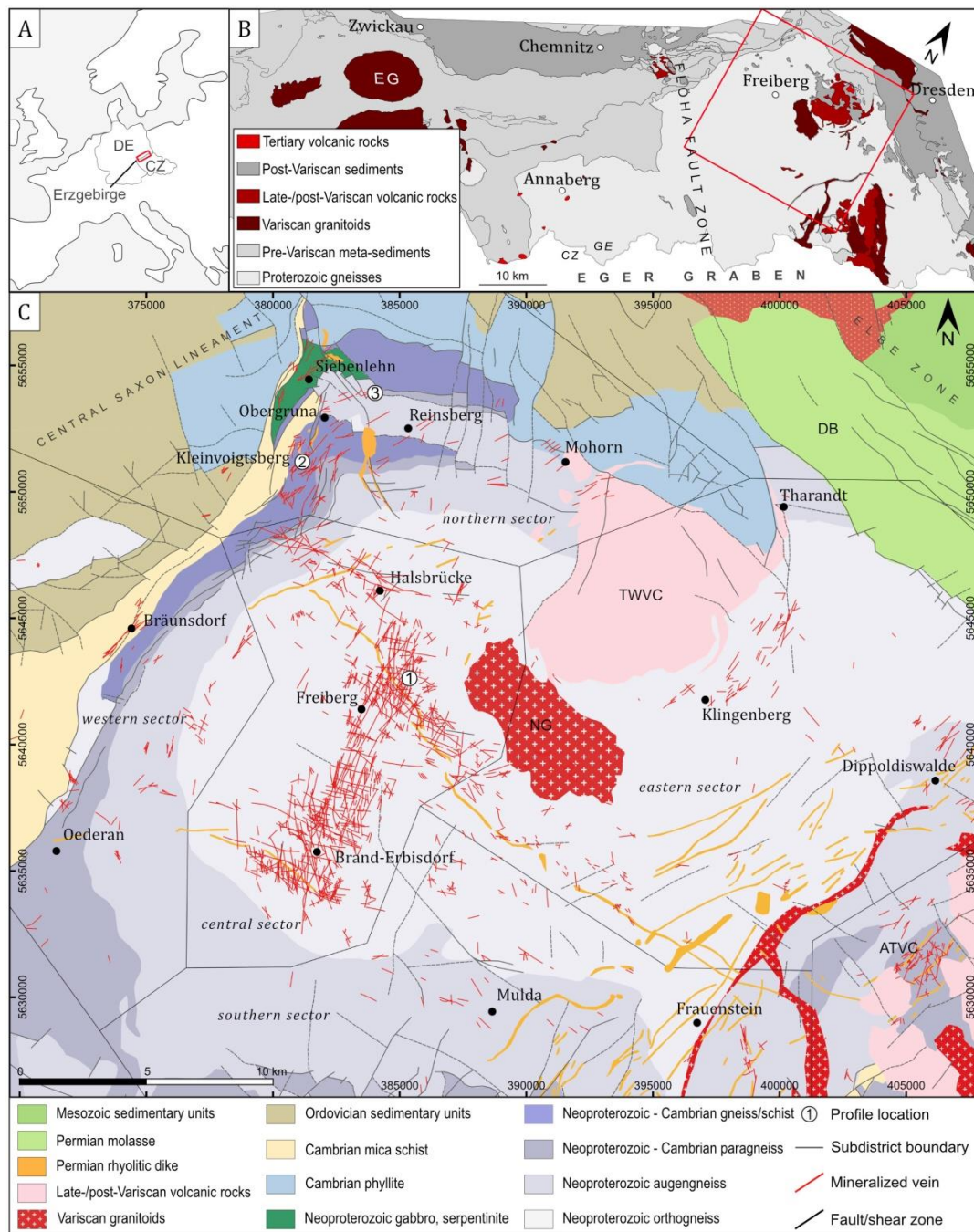


Spatial and Temporal Evolution of the Freiberg Epithermal Ag-Pb-Zn District, Germany

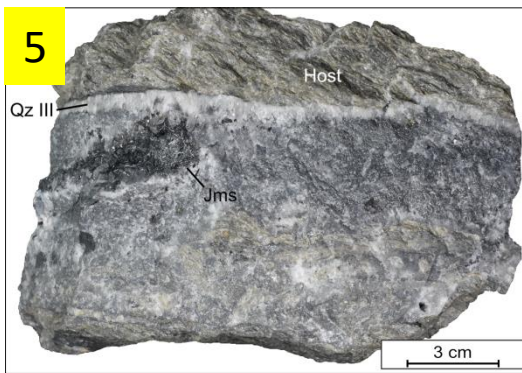
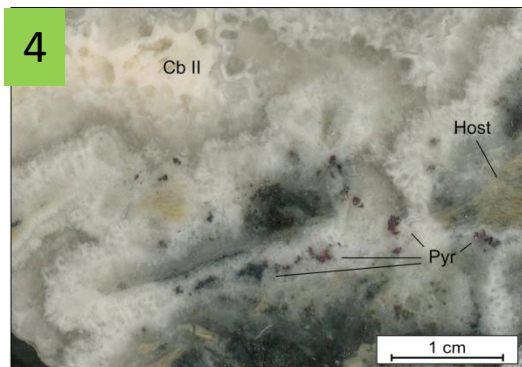
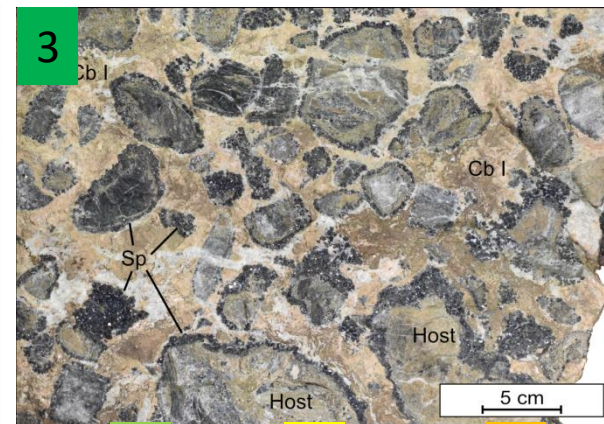
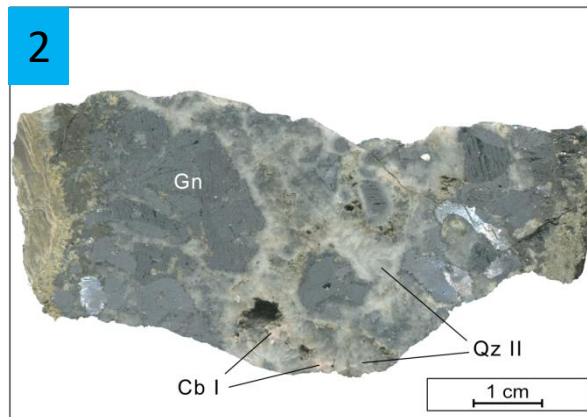
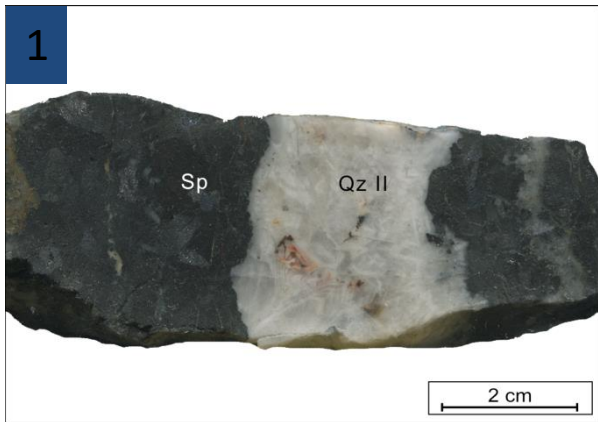
Laura J. Swinkels ; Jan Schulz-Isenbeck; Max Frenzel; Jens Gutzmer; Mathias Burisch

Economic Geology (2021)

<https://doi.org/10.5382/econgeo.4833> [Article history](#) 

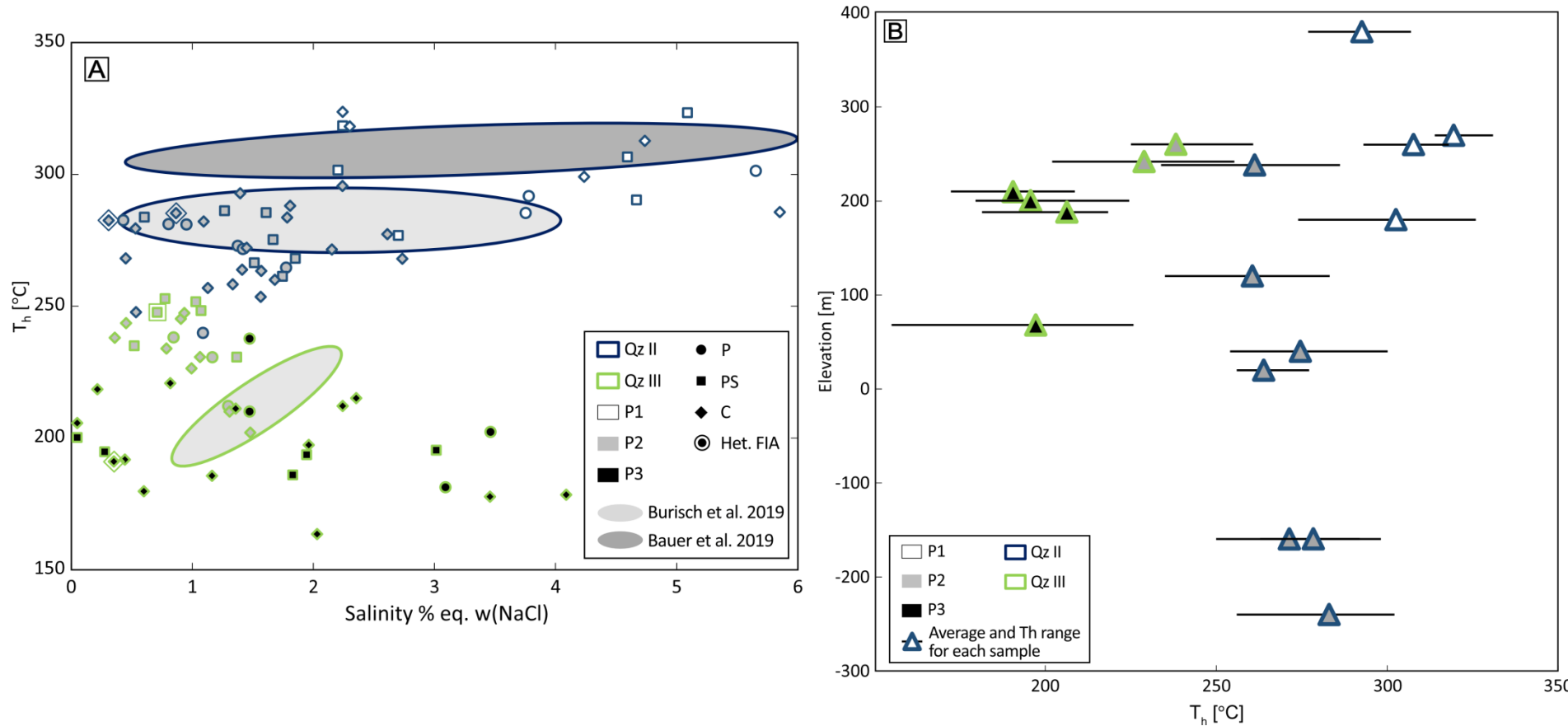


Mineral associations



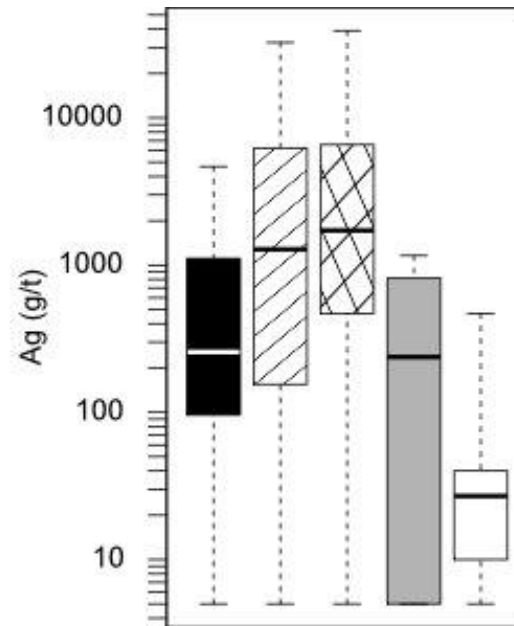
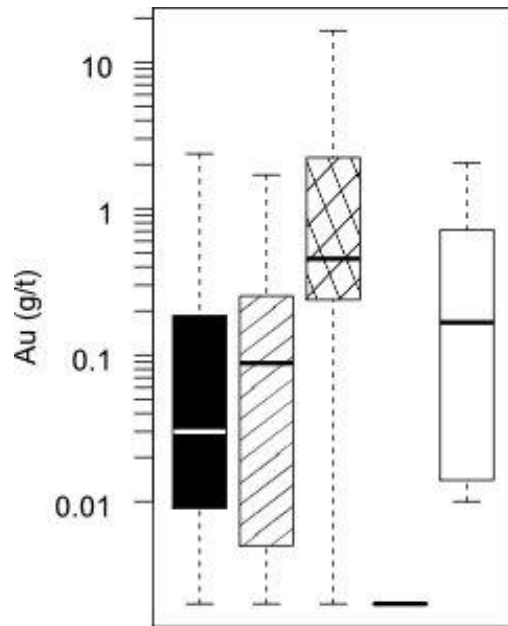
	1	2	3	4	5	6
	sphalerite-pyrite-quartz	galena-quartz±carbonate	sphalerite-Ag-sulfides-carbonate	Ag-sulfides-quartz	stibnite-quartz	quartz-carbonate
Quartz	I	II		IIIa	IIIb	IV
Carbonates			I		II	
Arsenopyrite	I		II	III	--	--
Pyrite						--
Sphalerite	I		II		--	--
Galena					--	--
Chalcopryrite						
Cassiterite						
Fahlore						
Pyrargyrite						--
Stephanite						
Polybasite						
Acanthite						
Sb-sulfides						

Microthermometry



A) Salinity (in % eq. w(NaCl)) versus homogenization temperature (°C) of all fluid inclusion assemblages. Quartz generations are indicated by the color of the rim, and sample location with the symbol color. Symbol shape indicates type of fluid inclusion assemblage: primary (P), pseudo-secondary (PS), and clusters (C). Heterogeneously trapped fluid inclusion assemblages are marked with a double rim. B) Elevation (m) versus homogenization temperature (°C) of analyzed fluid inclusion assemblages averaged per quartz generation per sample. The range of homogenization temperatures is indicated by the line.

Whole-rock geochemical analysis



base-metal-qz



sp-ag-qz



ag-qz



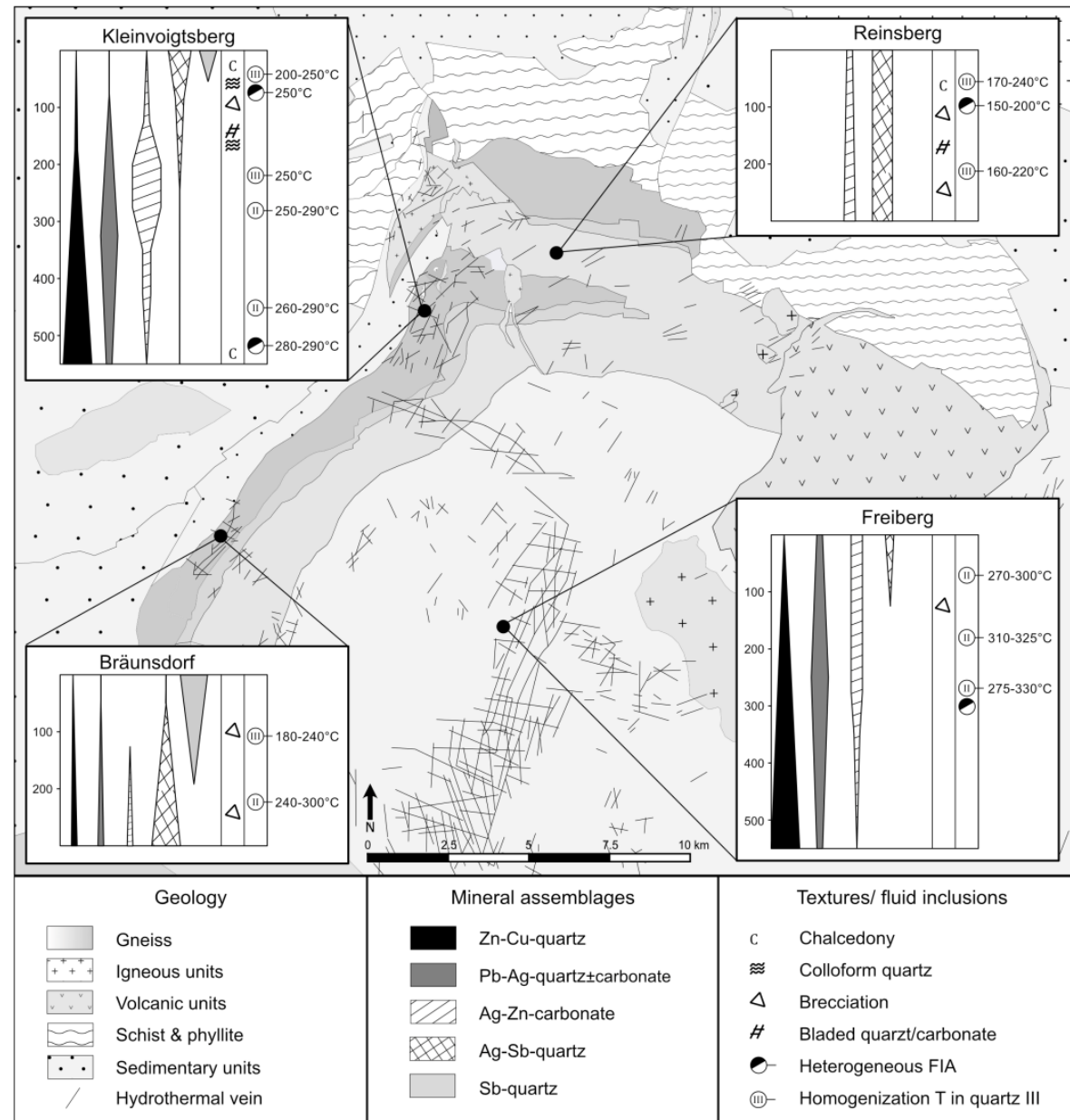
stb-qz



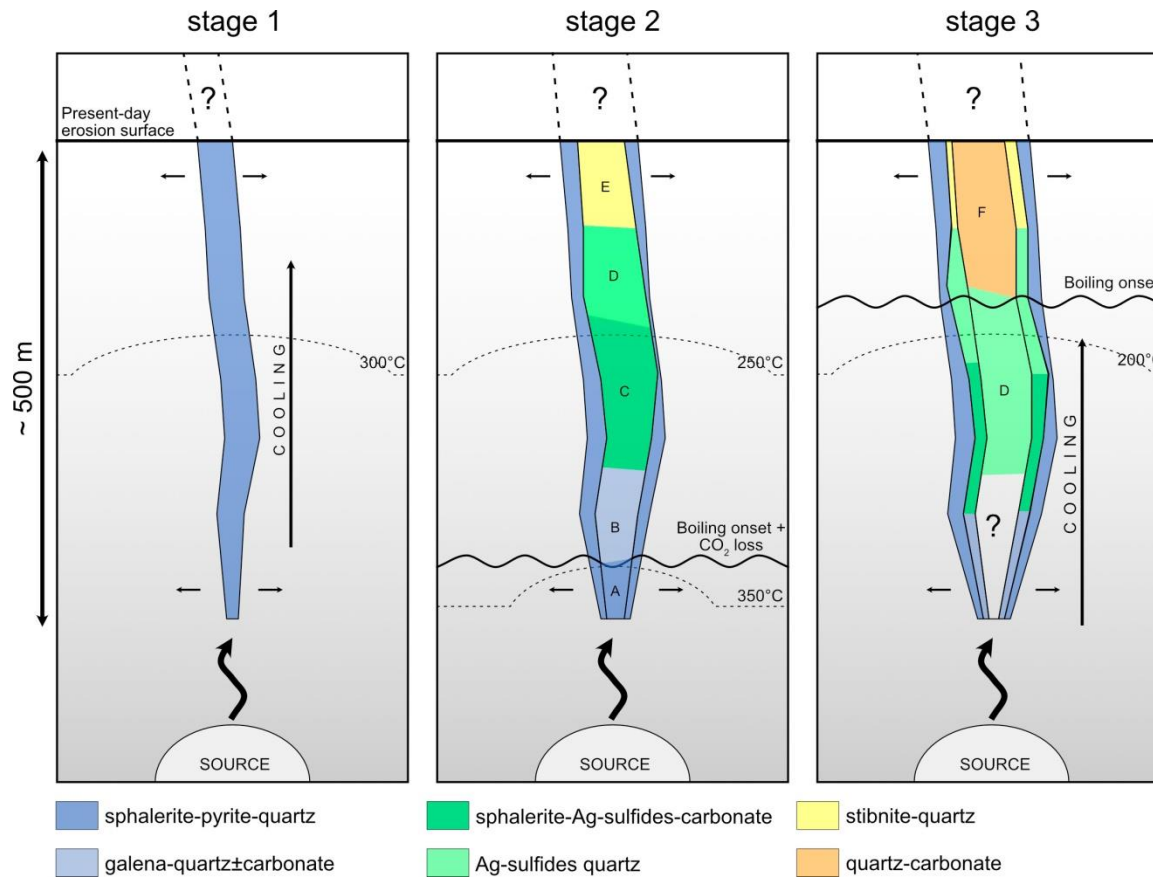
qz-cb

Vertical profiles - results

Summary of the mineral zoning, petrographic observations and microthermometric measurements within the investigated profiles and their location in the district (map modified after Hoth et al. 1980). Observations from Bräunsdorf were added after Burisch et al. (2019a).

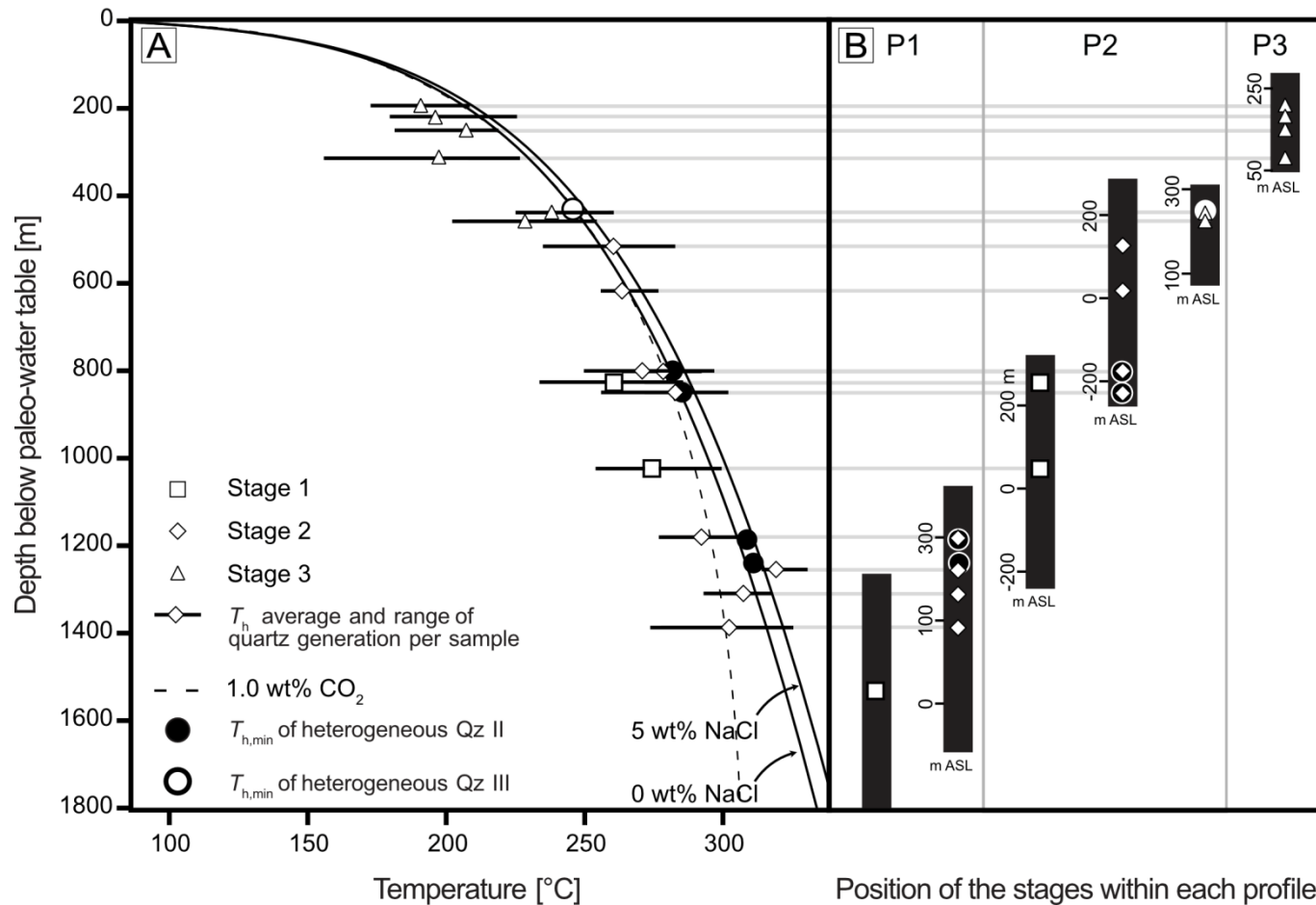


Formation model



Schematic model of the temporal (stages) and depth (A,B,C,D,E,F) evolution of the Freiberg epithermal system.

Paleo-depth estimates



A) Temperature versus depth diagram with boiling curves for salinities of 0% and 5% eq w (NaCl) and 1.0 wt% CO_2 (Haas, 1971; Hedenquist and Henley, 1985). Depth estimates are based on the minimum homogenization temperature of heterogeneous fluid inclusion assemblages from profile 2 and Bauer et al. (2019). B) Minimum paleo-depth constraints for each profile (P1, P2, and P3) and stage (1, 2, 3), based on the minimum depth of the fluid inclusion assemblages. Black bars represent the vertical extent of mineralization stages observed in the profile samples with an axis of their present-day elevation AMSL. Stage 1 of profile 1 could not be constrained.