

Supplement of

How much K is oK? – Evaluating different methods for K-concentration determination and the effect of the internal K-concentration on feldspar luminescence dating

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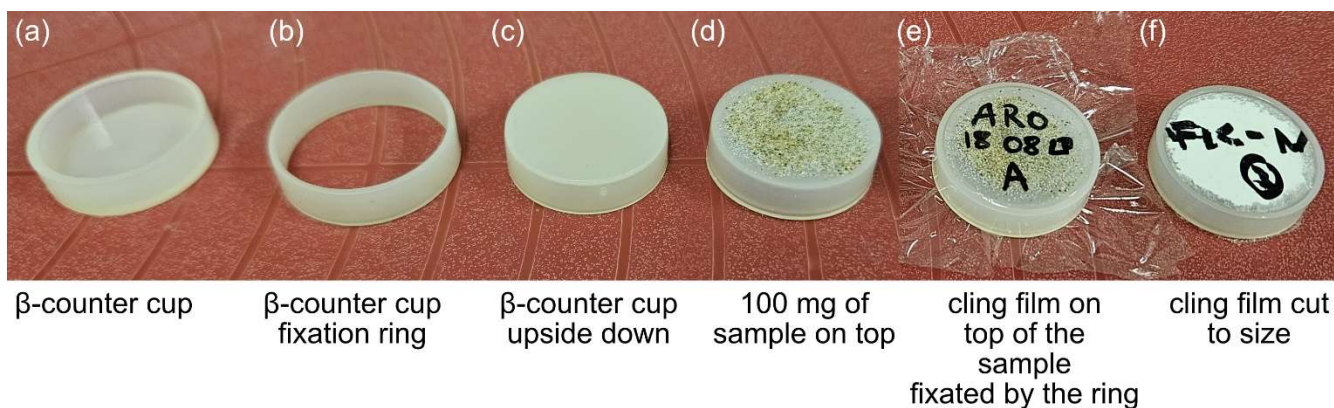


Figure S2. Preparation of feldspar samples for measurements in the β -counter. a) a plastic β -counter cup in its normal position. b) a plastic ring with a slightly larger diameter than the β -counter cup. c) a plastic β -counter cup in the upside-down position. d) 100 mg of feldspar sprinkled onto the upside-down β -counter cup. e) a piece of cling film labelled with the sample name is placed on top of the sample material on the upside-down β -counter cup and secured by the plastic ring. f) the same as shown in e) but with the excess cling film cut off.

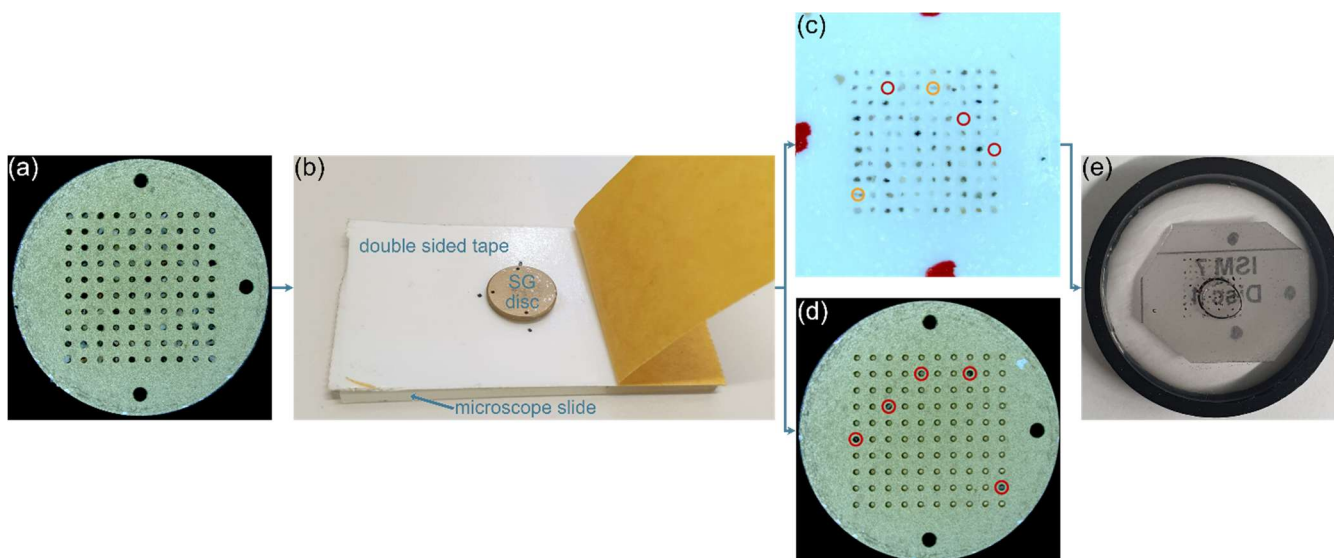


Figure S3. Sample preparation for the single grain SEM-EDX and μ -XRF measurements. a) a single grain (SG) sample disc after luminescence measurements filled with all 100 grain holes filled. b) SG disc facing downward onto double sided sticky tape. The tape is attached to a glass microscope slide on the other side. The directions of the three positioning holes are marked on the tape. c) grains on the sticky tape after disc removal. Red circles show locations where no grain was transferred and yellow circles show locations where only parts of a grain were transferred while still parts stuck in the SG disc. d) SG disc after removal from sticky tape. Red circles show position of grains/parts of grains still within grain holes. e) grains fixated in resin with a polished surface.

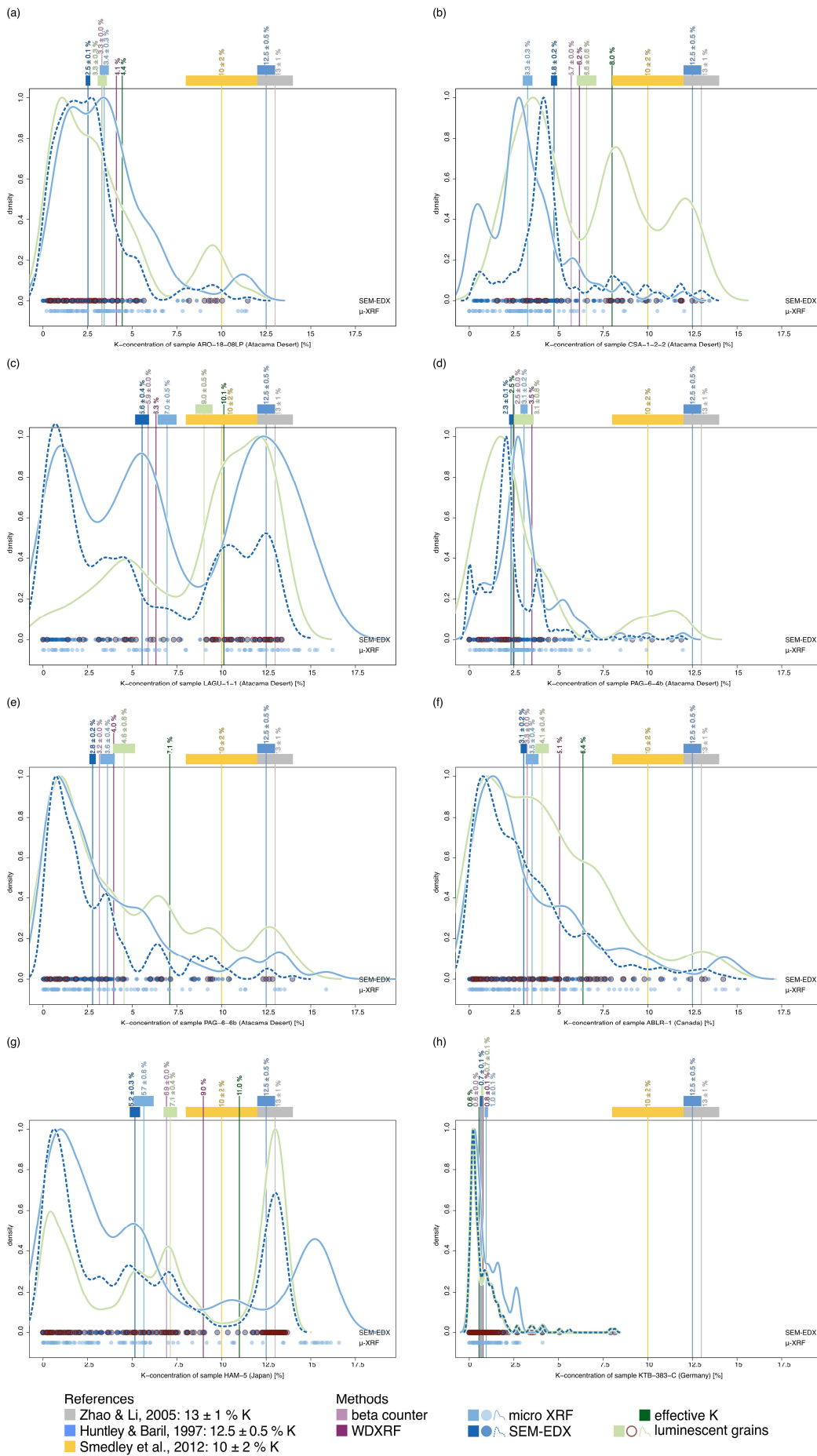


Figure S4. Single-grain K-concentrations for the eight samples not depicted in Fig. 3 of the main text. The dark blue dotted density curves and dots are based on the SEM-EDX measurements and the light blue ones on the μ -XRF measurements. The red circles around the dark blue dots and the light green density curve represent the *luminescent grains*. The vertical lines represent the K-concentrations presented in section 4.1, boxes above the graph representing their errors.

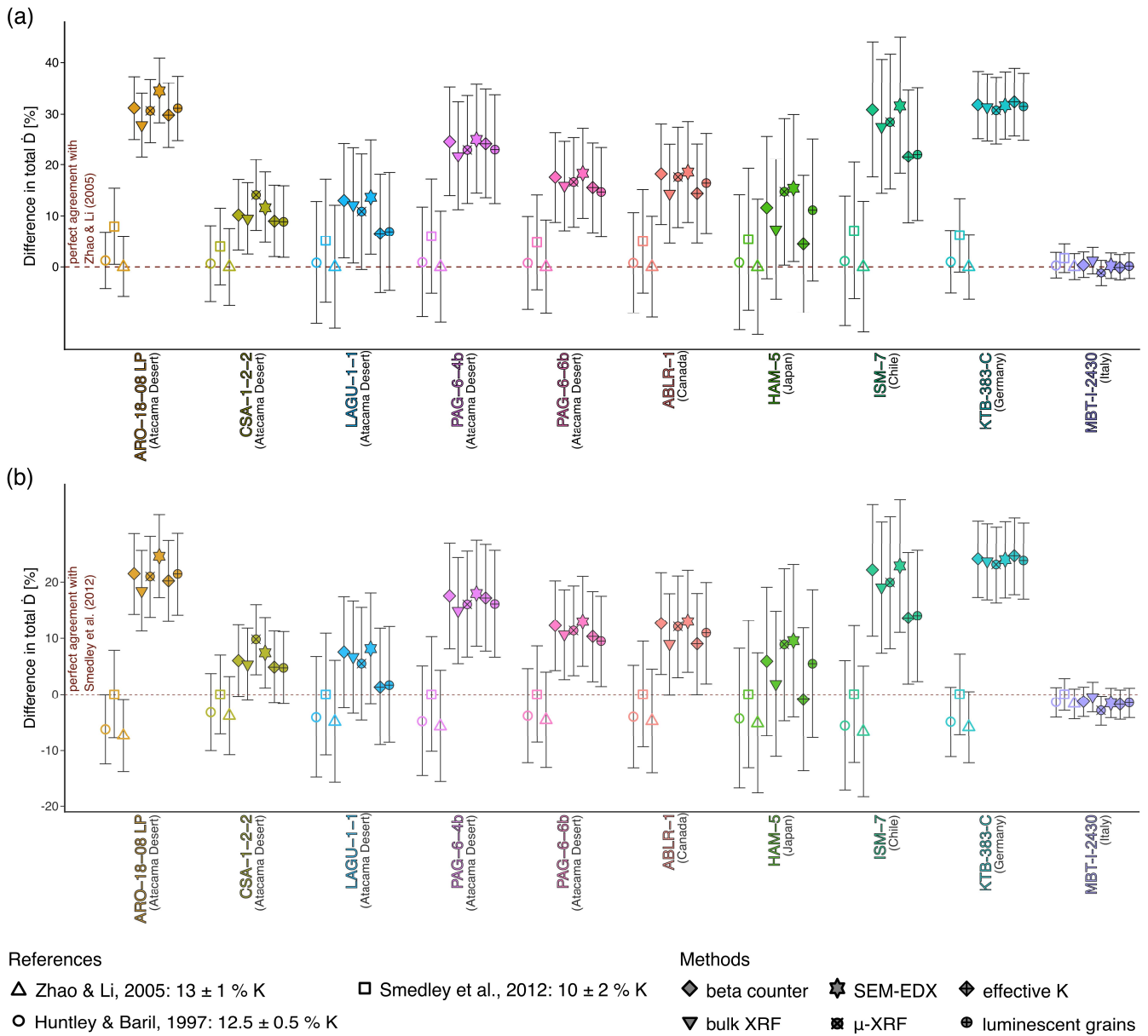


Figure S5. \dot{D} results. a) a comparison between the total \dot{D} based on the K-concentration of 13 ± 1 (Zhao & Li, 2008) and the total \dot{D} based on the measured K-concentrations and luminescence-weighted K estimates. b) a comparison between the total \dot{D} based on the K-concentration of 10 ± 2 (Smedley et al., 2012) and the total \dot{D} based on the measured K-concentrations and luminescence-weighted K estimates.

For table S1. And S4. see attached supplementary table 1 and table 4 file.

Table S2. Overview of the K-concentrations with which the five most frequently cited sources were quoted.

Reference	recommended/mentioned K-concentration	cited as	Frequency
Huntley and Baril, 1997	$12.5 \pm 0.5 \%$	$12.5 \pm 0.5 \%$	204
		12 %	2
		$12 \pm 1 \%$	2
		$12 \pm 2 \%$	1
		$12 \pm 0.5 \%$	7
		$12.5 \pm 1 \%$	12
		$12.5 \pm 2.5 \%$	2
		12.5 %	8
		$13 \pm 1 \%$	25
		12.5 ± 5	1
		$12.5 \pm 0.12 \%$	2
		no mentioned	7
Zhao and Li. 2005	13 - 14 %	$13 \pm 1 \%$	35
		$13 \pm 0.5 \%$	1
		$13.5 \pm 0.2 \%$	1
		$12.5 \pm 0.5 \%$	7
		$12.5 \pm 1 \%$	2
		12.5 %	1
Huntley and Hancock, 2001*	No recommendation but used $12.5 \pm 0.5 \%$	$12.5 \pm 0.5 \%$	12
		$12.5 \pm 2 \%$	1
		$13 \pm 1 \%$	15
		$12.5 \pm 1 \%$	2
		not mentioned	3
Smedley et al., 2012	$10 \pm 2 \%$	$10 \pm 2 \%$	17
		$10 \pm 3 \%$	3
		$12 \pm 0.5 \%$	2
		not mentioned	2
Li et al., 2008	No recommendation but used $13 \pm 1 \%$	$13 \pm 1 \%$	14
		$12.5 \pm 0.5 \%$	2

*this paper refers to the ratio of K-concentration and Rb-concentration and was three times cited alone without an additional citation

Table S3. Single-grain dose recovery test SAR measurement protocol. Heating rate for steps 2–4 and 6–8 2 °C/s.

Step	Treatment ^a	Observation
1	Given dose D _i	
2	Preheat, 60s at 200°C	
3	IRSL, 2s at 50°C	
4	IRSL, 3s at 175°C	L _x
5	Given test dose D _t	
6	Preheat, 60s at 200°C	
7	IRSL, 2s at 50°C	
8	IRSL, 3s at 175°C	T _x
9	Return to step 1	

^a given dose D_i [Gy]: 150, 0, 50, 150, 300, 500, 800, 0, 50, 150; test dose D_t [Gy]: 50