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# **EFFECTIVE MINERAL EXTRACTION**

A note on improving heavy liquid density separation during sample preparation in Trapped Charge Dating



Poster ID #37

Even though isolating guartz (Qz) & feldspars (F) grains is crucial in Trapped Charge Dating, the separation procedure may be challenging & dependent on several natural factors but also on laboratory limitations.

Even so, laboratories vary in practice: minimal or poor physico-chemical details are often published, posing an enormous challenge when improving or comparing relatively simple & long established mineralogical protocols.



ESR Mineral Extraction Heavy Liquids Sample Care Laboratory Preparation

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OSL

- For mineral separation, most laboratories use heavy liquids: mostly SPT, some LST, few LMT.
- 2. Most authors use 1- or 2-step dense liquid separation, independent of sediment type or particle size.
- 3. >10 different individual or pairs of values ranging from 2.50 to 2.75 g/cm<sup>3</sup> have been reported over 30 yrs of published literature:
  - a) 2.58 or 2.62 g/cm<sup>3</sup> are the most commonly used 1-step values for F or Qz separation respectively.
  - b) 2.62 & 2.70 g/cm<sup>3</sup> are the most commonly used 2-step values overall.
- 4. Particle size fractions range from 63 to 250 µm, being 90-150 µm the most common range.

# THE EXPERIMENT



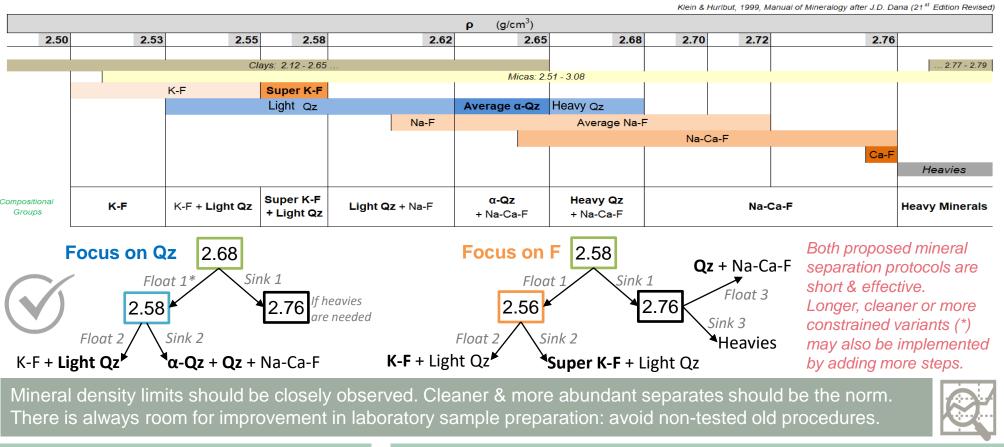
3 Samples: A 90% Qz-rich C 50% A – 50% E Part 1: Separation using 3 routinely used values A with 2.62 C with 2.62 & 2.70 Part 2: Separation using 2 new protocols Focus on Qz: 2.68 then 2.58 (optional 2.76) Focus on F: 2.58 then 2.76 then 2.56

### DECIII TC

	RESULIS				
	% of material recovered after each protocol				
B		Sample A	Sample B	Sample C	
	2.62	70% Qz	-	-	
0	2.58	-	60% K-F	-	
	2.70; 2.62	-	-	65% Qz	
	2.68; 2.58 (2.76)	90% Qz	-	85% Qz	
	2.58; 2.76; 2.56	-	80% K-F	70% K-F	

#### SPECIFIC GRAVITY GRAPHIC CHART

Density Ranges for Quartz & Feldspars & other common "contaminants"



### Reviewed publications with p details:

- Pre-1990s: 5 ٦.
- 2. 1990s: 10
- 3. 2000s: 10
- 2010s: 20 4.
- 5. 2020s: 6

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