

# Sample Preparation for Optically Stimulated Luminescence (OSL) Dating

The preparation of sediment samples for Optically Stimulated Luminescence (OSL) dating follows nine steps, described below. All procedures must be carried out in a darkroom to prevent unintended bleaching.

### Wet sieving

The diagram shows a spoon and a tube with red 'X' marks indicating that the sample should not be dry-sieved. A faucet icon indicates the use of water. Three sieves are shown with their mesh sizes: 250µm (top), 180µm (middle), and 63µm (bottom). Below the sieves, three collection boxes are shown: >250 µm (top), 250-180 µm (middle), and 180-63 µm (bottom). A bucket icon is shown at the bottom. Two boxes labeled 'OSL' and 'λ' are shown on the left.

### Hydrogen Peroxide (H<sub>2</sub>O<sub>2</sub>) treatment

Organic matter

250-180 µm

### Hydrochloric Acid (HCl 10%) treatment

Carbonates

250-180 µm

Rinse the sample 5 times after each chemical treatment.

Dry (40-60°C)

### Density separation using Lithium Metatungstate (LMT)

Separation of light and heavy minerals (LMT 2.75g/cm<sup>3</sup>)

1°LMT - 2.75 /cm<sup>3</sup> - Separating light and heavy minerals

The diagram illustrates the density separation process in four stages:

- Falcon 50ml**: Initial sample in a Falcon tube.
- LMT until the conical part is filled in.**: Adding LMT to the Falcon tube.
- Add sample up to 10ml**: Adding the sample to the LMT.
- Top up with LMT until 30/25ml**: Final LMT level in the Falcon tube.

**Centrifuge 3 min/1000 rpm**: The Falcon tube is centrifuged, resulting in a **light** fraction (top) and a **heavy** fraction (bottom).

**Remove as much as possible from LMT**: The heavy fraction is transferred to an Erlenmeyer flask.

**"Fishing" for the heavy ones at the bottom with the pipette.**: The heavy fraction is further purified.

**Discard the heavy Erlenmeyer with the filter.**: The heavy fraction is discarded.

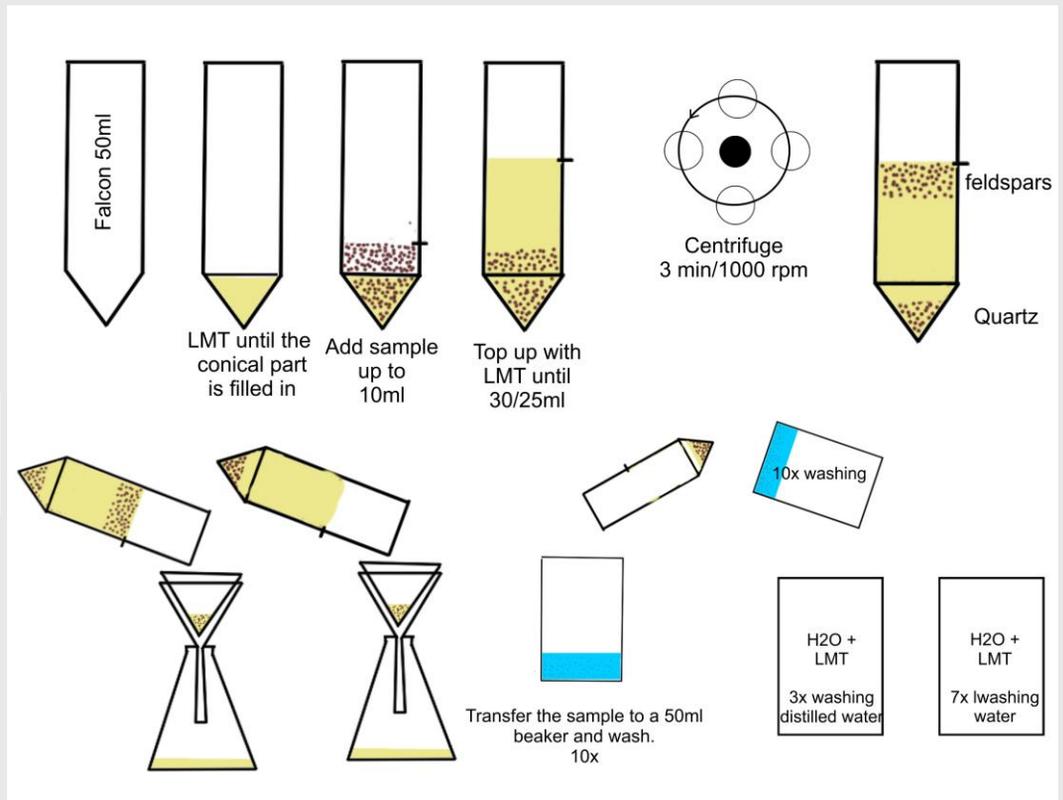
**10x washing**: The sample is washed 10 times.

**Transfer the sample to a 50ml beaker and wash. 10x**: The sample is transferred to a beaker and washed 10 times.

**3x washing distilled water** (H<sub>2</sub>O + LMT): The sample is washed 3 times with distilled water.

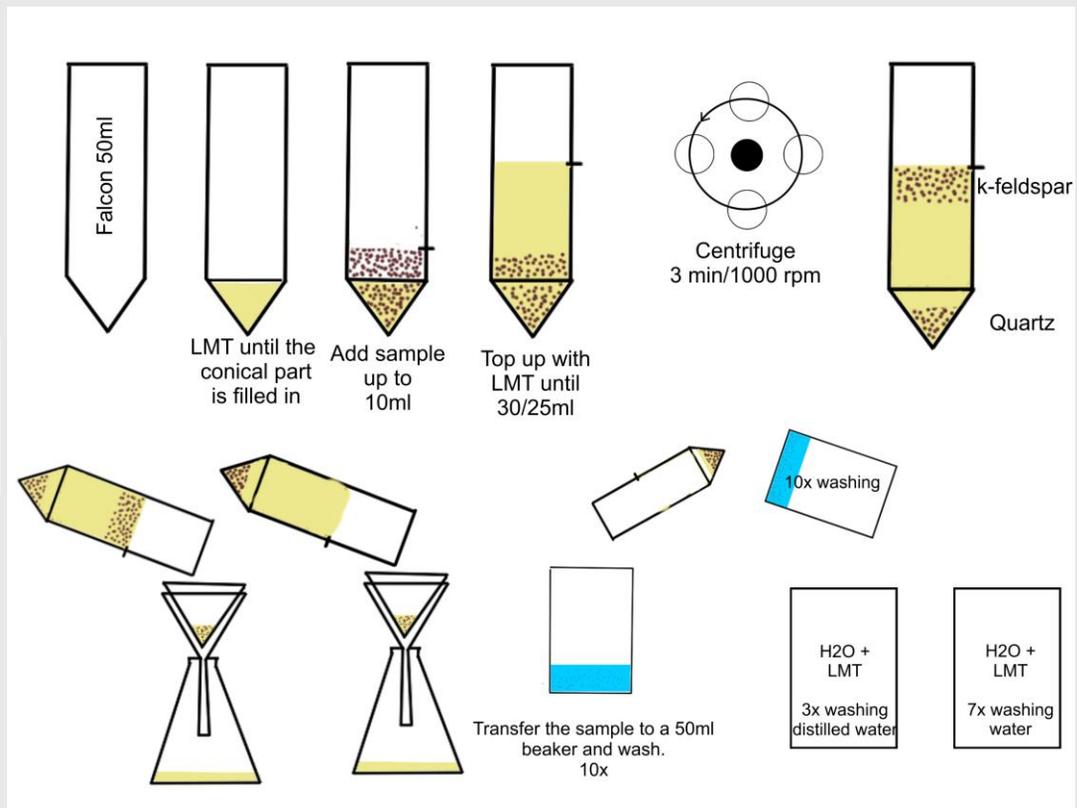
**7x washing water** (H<sub>2</sub>O + LMT): The sample is washed 7 times with water.

Dry (40-60°C)



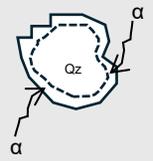
Separation of feldspar e quartz (LMT 2.62g/cm<sup>3</sup>)

Dry (40-60°C)



Separation of feldspars and potassic feldspar (k) (LMT 2.58g/cm<sup>3</sup>)

**Quartz** – eliminate the remaining feldspar and approximately 20 mm of the grain surface influenced by alpha radiation.



Hydrofluoric Acid (HF) treatment (HF 40% - quartz or 10% - k feldspar)

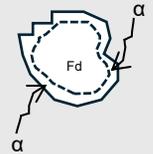


250-180 um



40 minutes

**k - feldspar** – remove approximately 20mm from the surface of the grains influenced by alpha radiation.



**Do not forget PPE**



250-180 um



40 minutes

After the attack, place the HF in the disposal bottle.  
Rinse the sample **5x** after each chemical treatment.

Hydrochloric Acid (HCl 10%) treatment



250-180 um



30 minutes

Remove any fluorides that may have precipitated in the previous attack.

Rinse the sample **5x** after each chemical treatment

Dry (40-60°C)



Dry sieving

250-180 um

180um

Lower size limit

Due to the HF attack, the quartz or feldspar grains lost their initial size and must be disregarded.

Store and label the sample.



- Lab. Code
- Grain-size fraction
- Mineral (Qz ou Fd)



RISOS/Lx room

Keep the sample protected from light