

An experiment in the production of Alum

Schweitzer

Alum crystal [potassium aluminum sulfate]



What is alum?



- Where

- $M^+ = Na^+, K^+, NH_4^+, Ag^+$ (Most common ions)

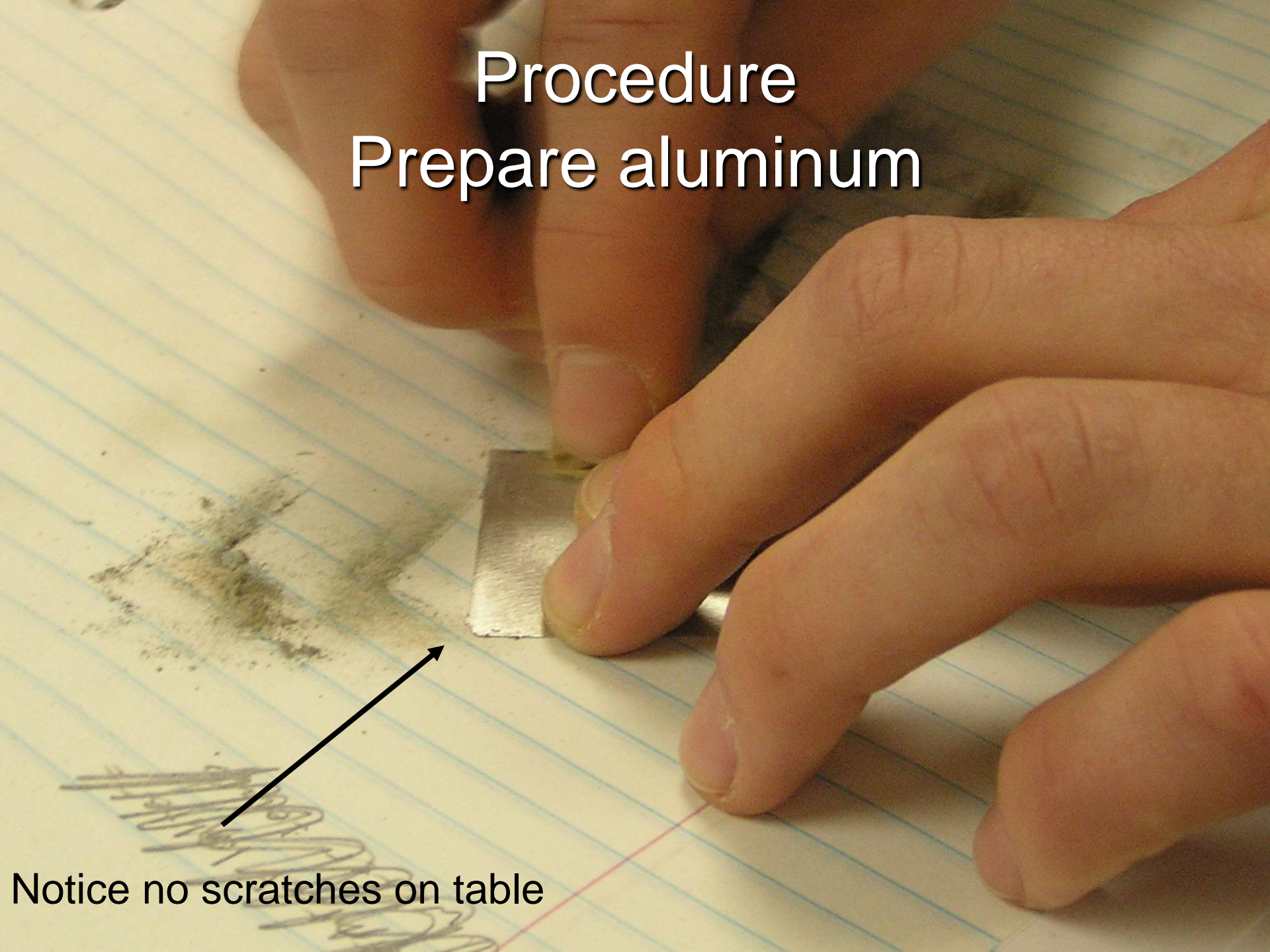
- $Al^{3+}, Fe^{3+}, Mn^{3+}$

Uses

- **Shaving alum** is a powdered form of alum used as an astrigent to prevent bleeding from small shaving cuts. The styptic pencils sold for this purpose contain aluminium sulfate or potassium aluminium sulfate. Similar products are also used on animals to prevent bleeding after nail-clipping.
- **Crystal deodorant:** Alum was used in the past as a natural underarm deodorant in Mexico,
- **Alum powder**, found amongst spices at most grocery stores, is used in pickling recipes as a preservative, to maintain crispness, and as an ingredient in some play dough recipes.
- **Water treatment:** Alum (aluminium sulfate) is used in water treatment. The addition of alum to raw water causes small particles and colloids to stick together form heavier particles (floc) which will settle in water. This process is called coagulation or flocculation.
- **Fire retardant:** By soaking and then drying cloth and paper materials they can be made fireproof.
- **Wax:** Alum is used in the Middle East as a component in wax, compounded with other ingredients to create a hair-removal substance.
- **Foamite:** Alum is used to make foamite which is used in many fire extinguishers for chemical and oil fires.

Procedure

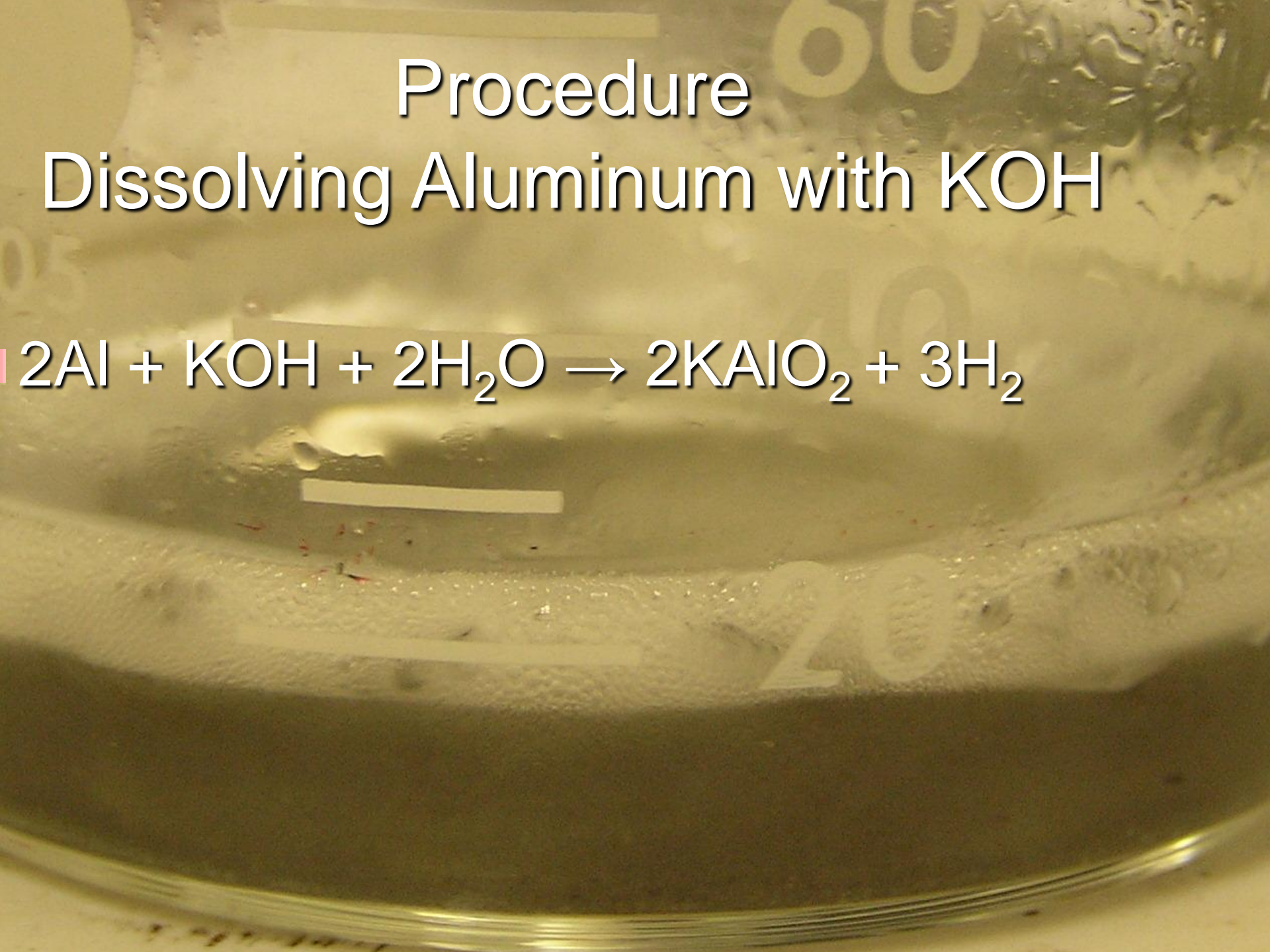
Prepare aluminum



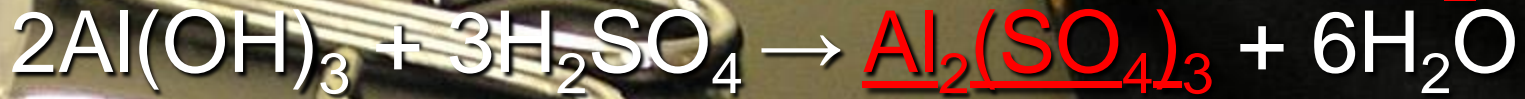
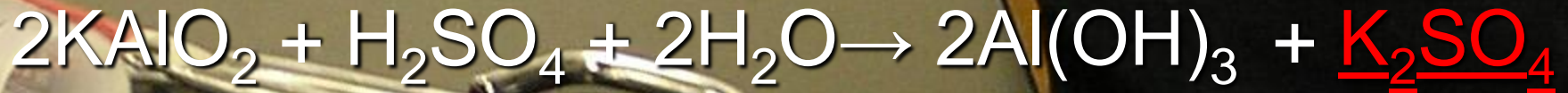
Notice no scratches on table

Procedure

Dissolving Aluminum with KOH

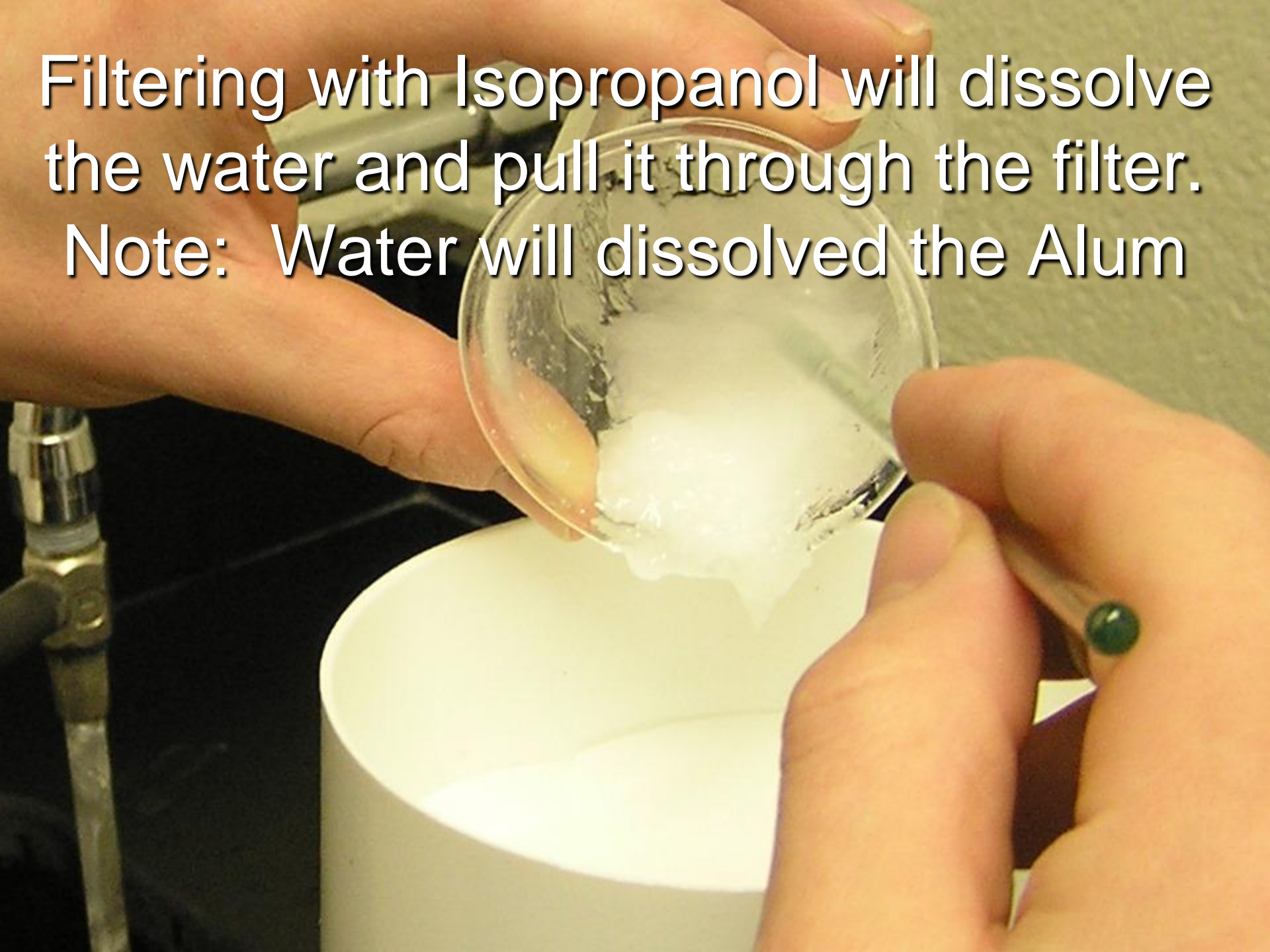


Procedure

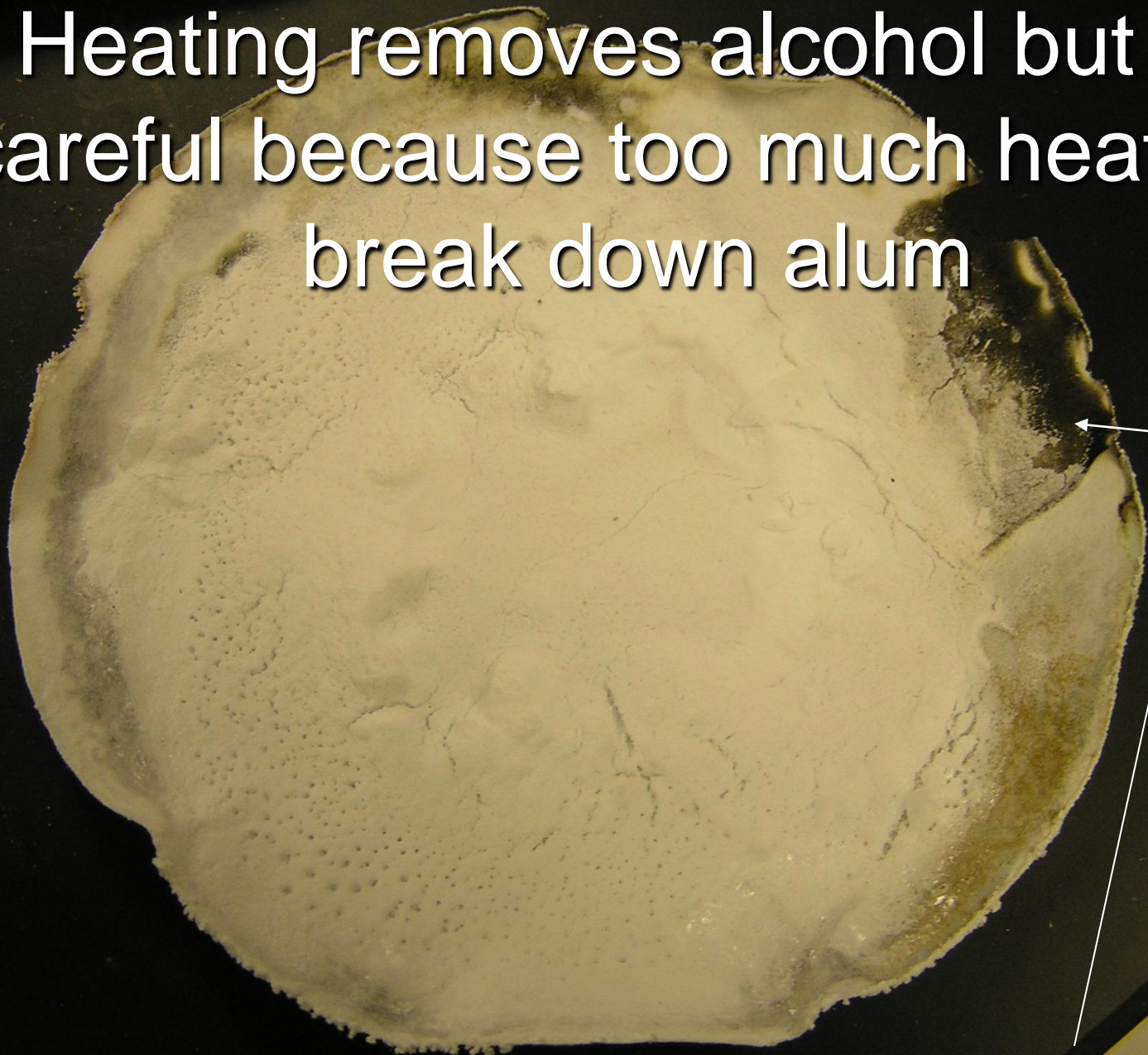


Cold temperatures may be needed to precipitate the Alum

Filtering with Isopropanol will dissolve the water and pull it through the filter.
Note: Water will dissolved the Alum



Heating removes alcohol but be careful because too much heat will break down alum



Decomposition starting



- The production of Alum is a 1:1 molar ratio between Aluminum and $\text{KAl}(\text{SO}_4)_2$