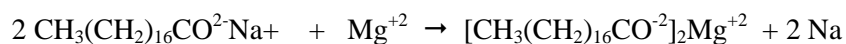


### III How Water Hardness Affects Cleaning Action

- Soaps react with  $\text{Ca}^{+2}$ ,  $\text{Mg}^{+2}$ ,  $\text{Fe}^{+3}$ , and sometimes  $\text{Mn}^{+2}$  in hard water to an insoluble film or soap scum.



#### Procedure

Caution: 25 % NaOH is very caustic. **Make sure goggles are on at all times.**

#### Preparation of Soap

- Oil, sodium hydroxide solution and ethanol (used as a solvent) are mixed and heated.
- The soap is precipitated with NaCl solution by increasing the density of the aqueous layer making the soap float.
- #6 Filter the precipitated soap using a 4 plies of cheesecloth on a gravity funnel.
- At this point the soap will be purified by redissolving it in water and reprecipitating until the pH of the soap is lower in alkalinity.

#### Testing for Soap properties

Every as written.