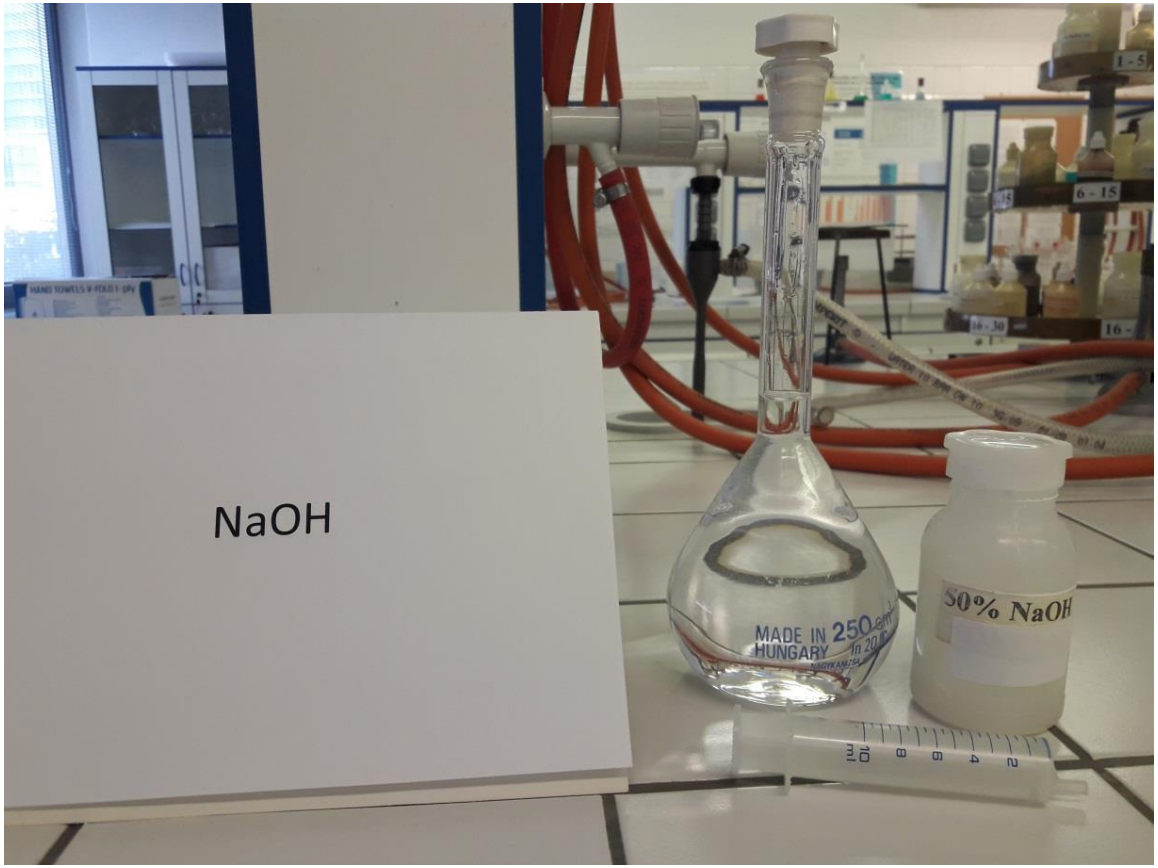
ALKALIMETRY–
Does food vinegar have the right composition?

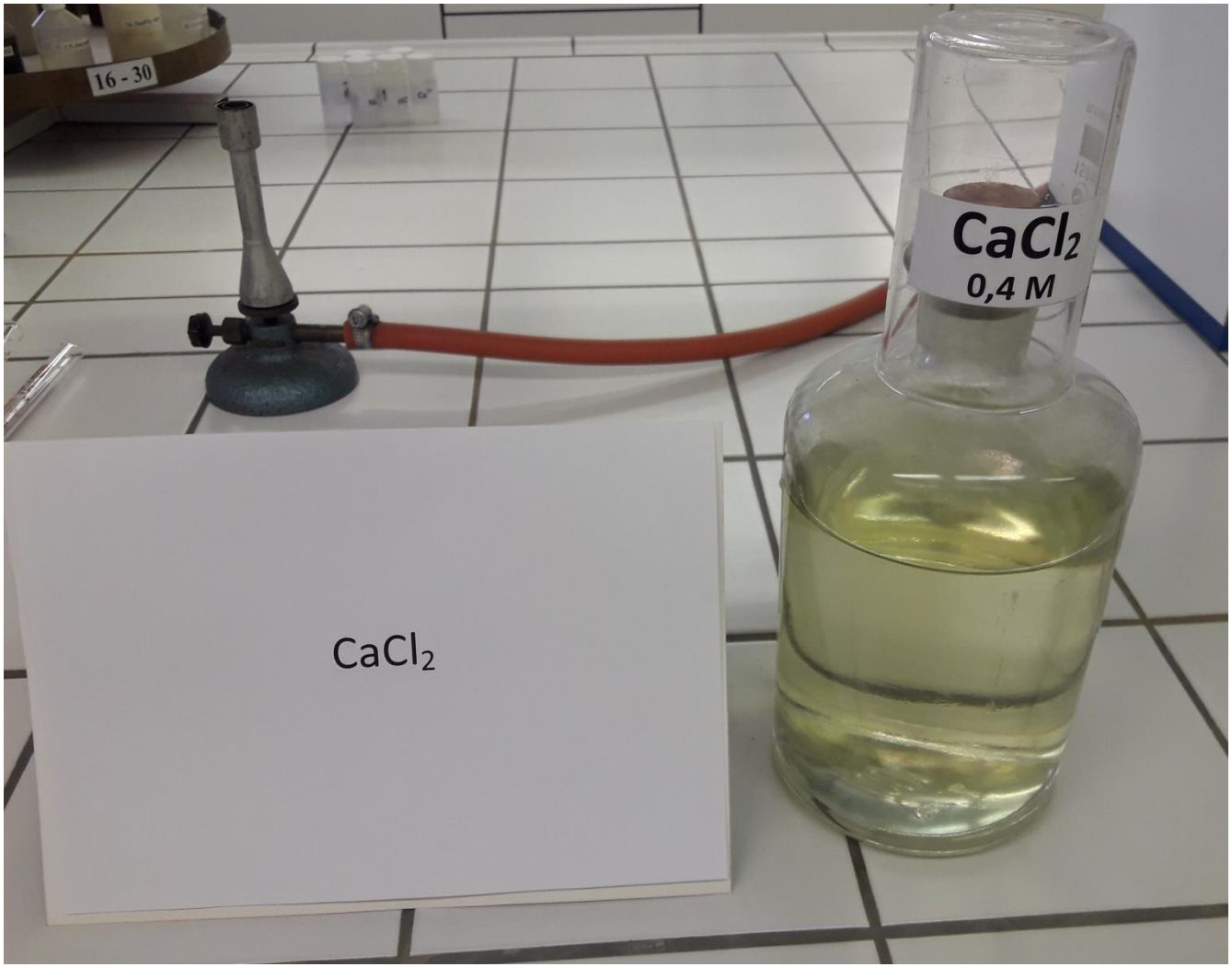
Laboratory instructions

Required working solutions:

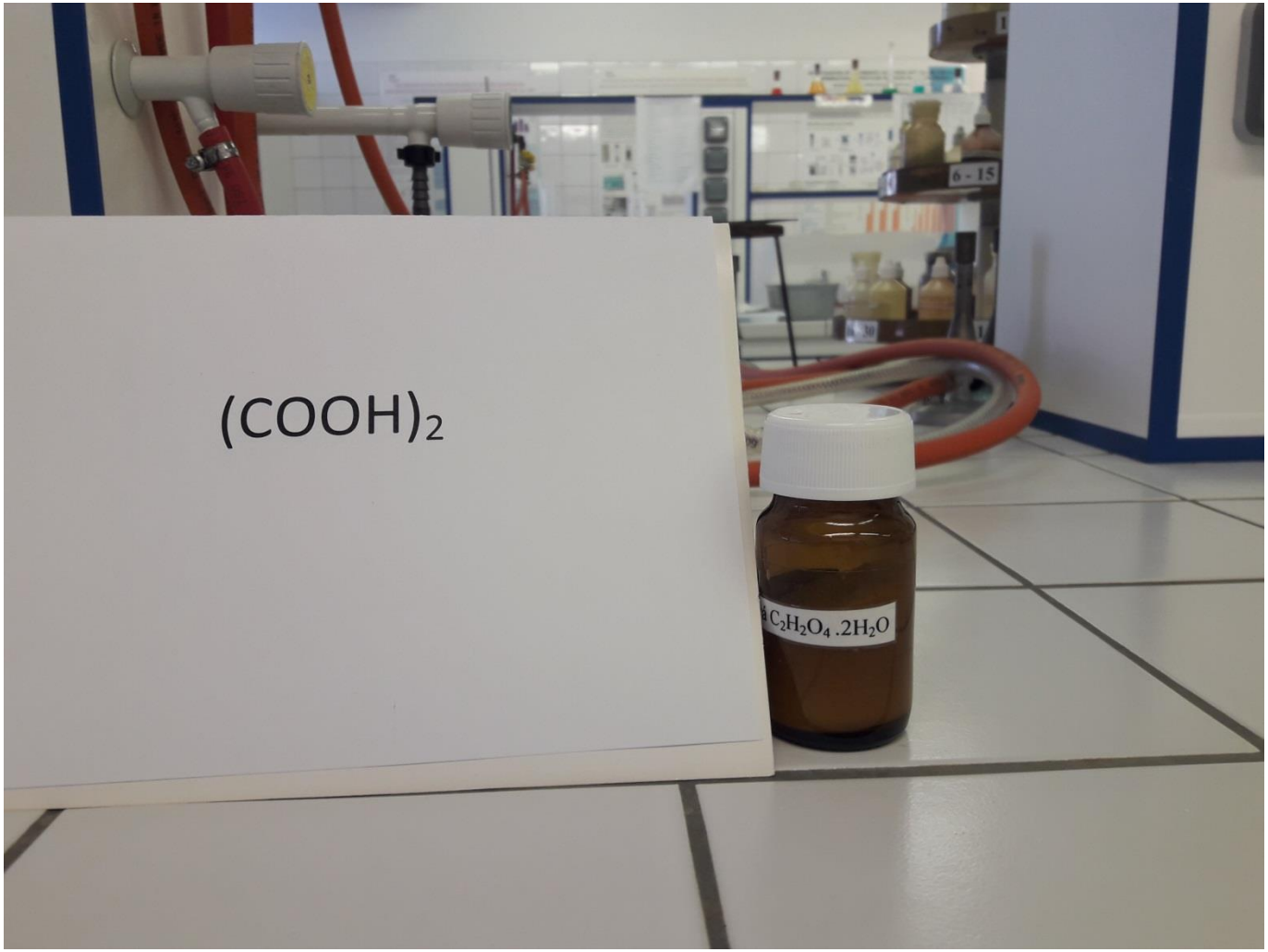
(Volumetric) Solution of NaOH with approximate concentration of 0.5 mol/l. The solution is prepared by diluting of NaOH stock solution with approximate concentration 50 % in 250 ml volumetric flask.



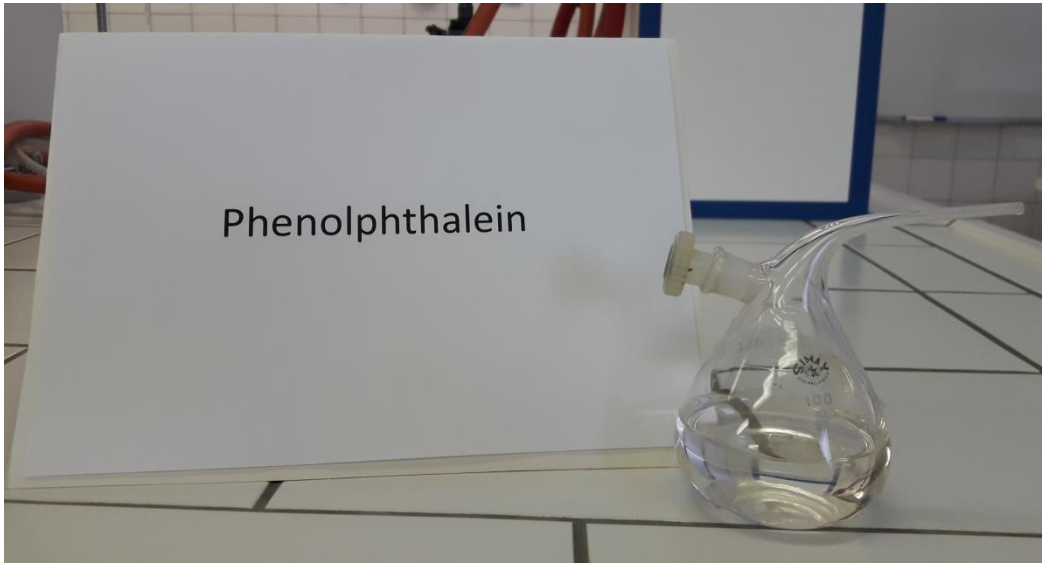
- $CaCl_2$ solution with approximate concentration 0.4 mol/l neutralized to methyl orange



- Oxalic acid



- Indicators methyl orange and phenolphtalein

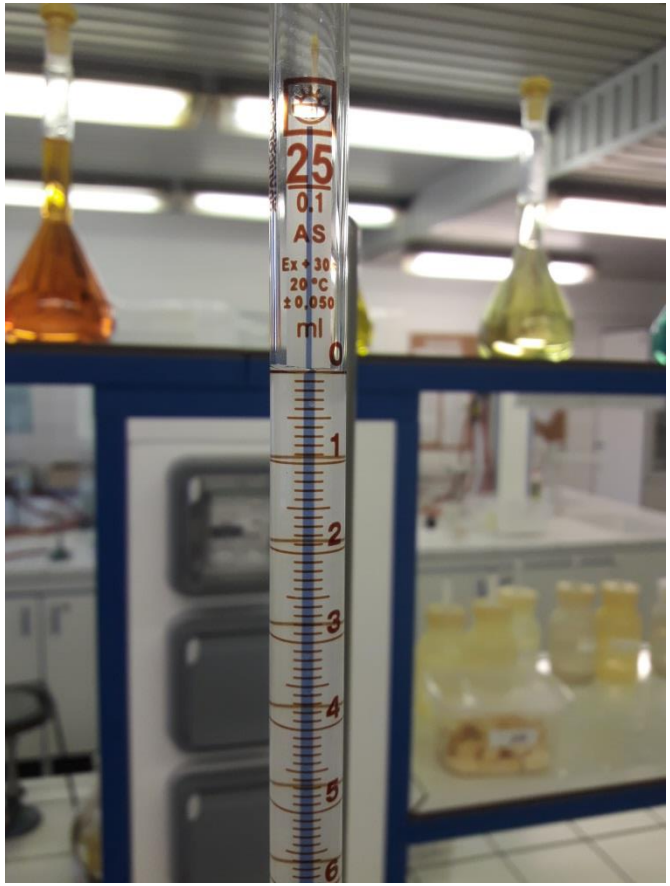


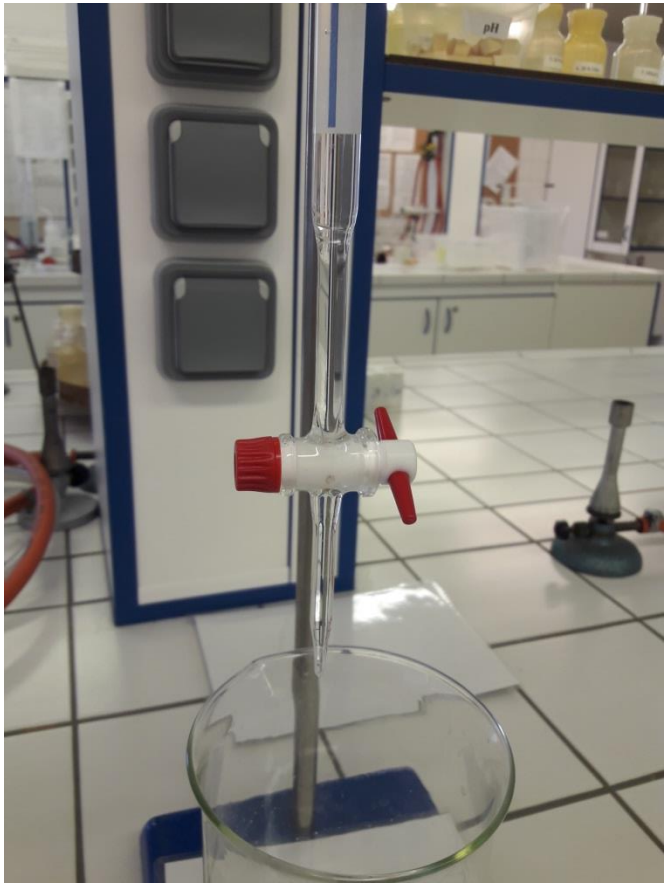
Sample - vinegar:

- Burette preparation:

Wash the burette twice with deionized water, after by (volumetric) solution and fill with NaOH solution to the zero mark.

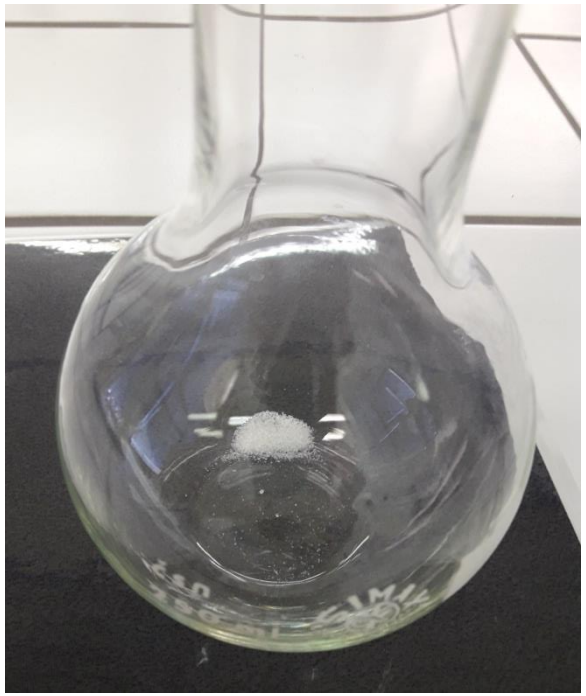
(In the case of strong alkali solutions, we use a burette with a Teflon valve. The glass valve can be blocked!)

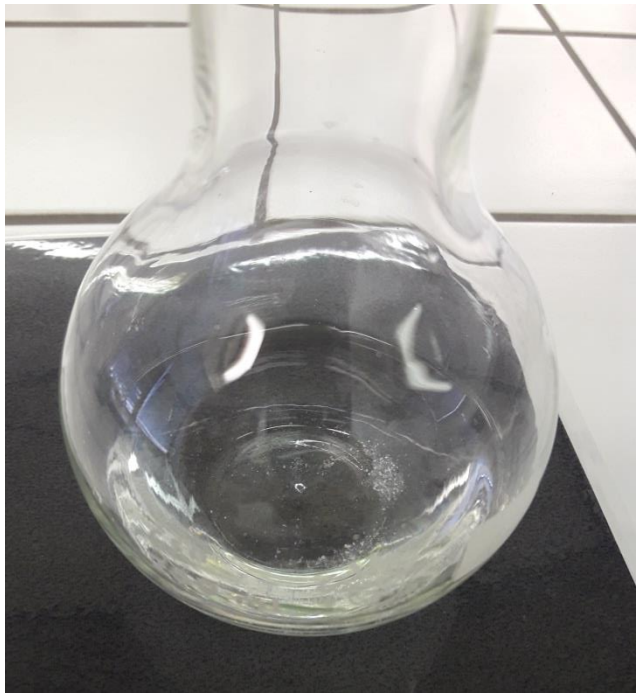


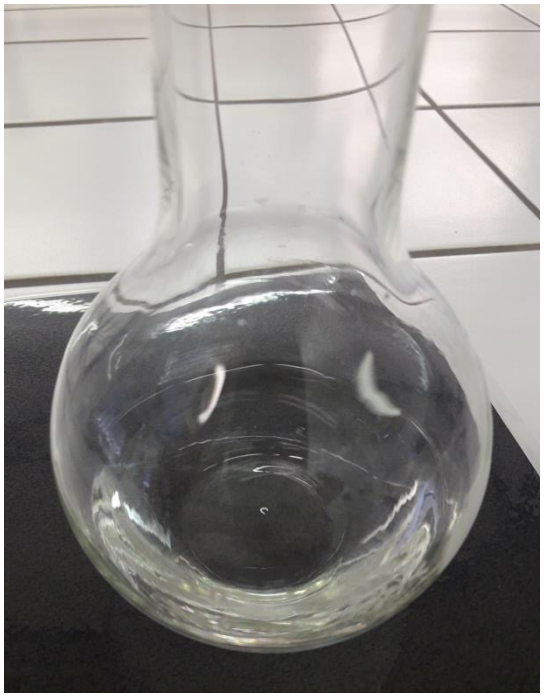


Standardization of NaOH on single solid oxalic acid weight:

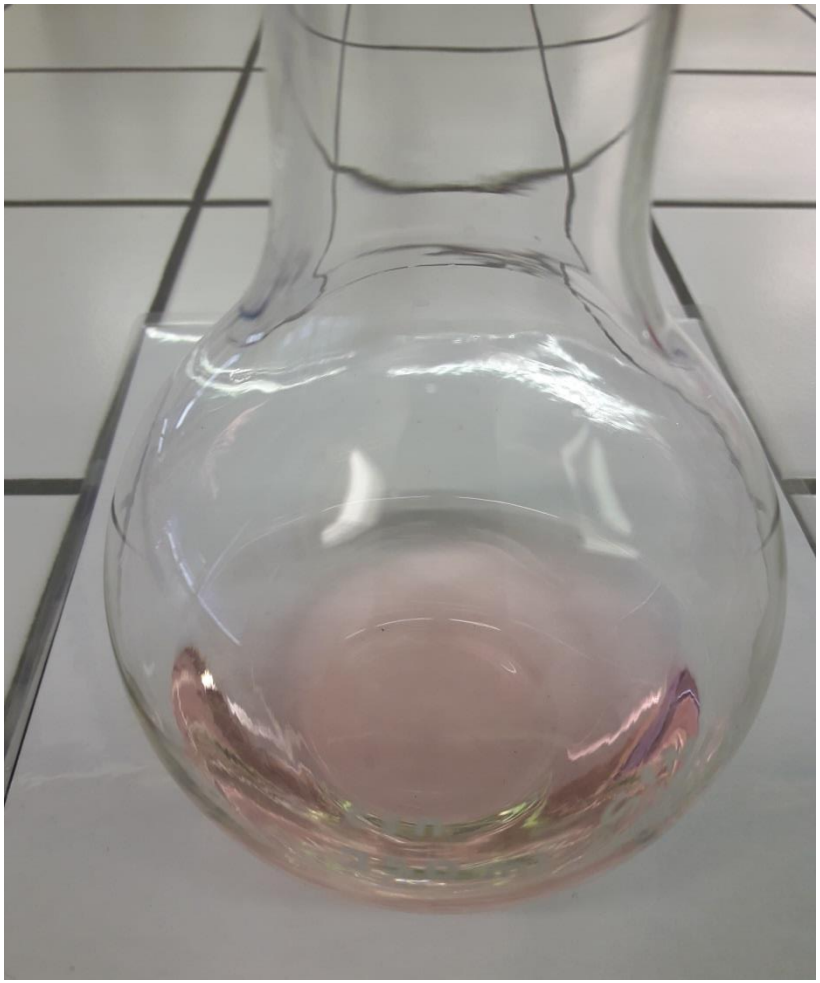
1. Weigh differently exactly 0.6303 g of oxalic acid dihydrate into a titration flask on an analytical balance. The weight does not necessarily be exact 0.6303 g but we need to know precise amount. Add approximately 50 ml of deionised water to dissolve. Prepare three weights.

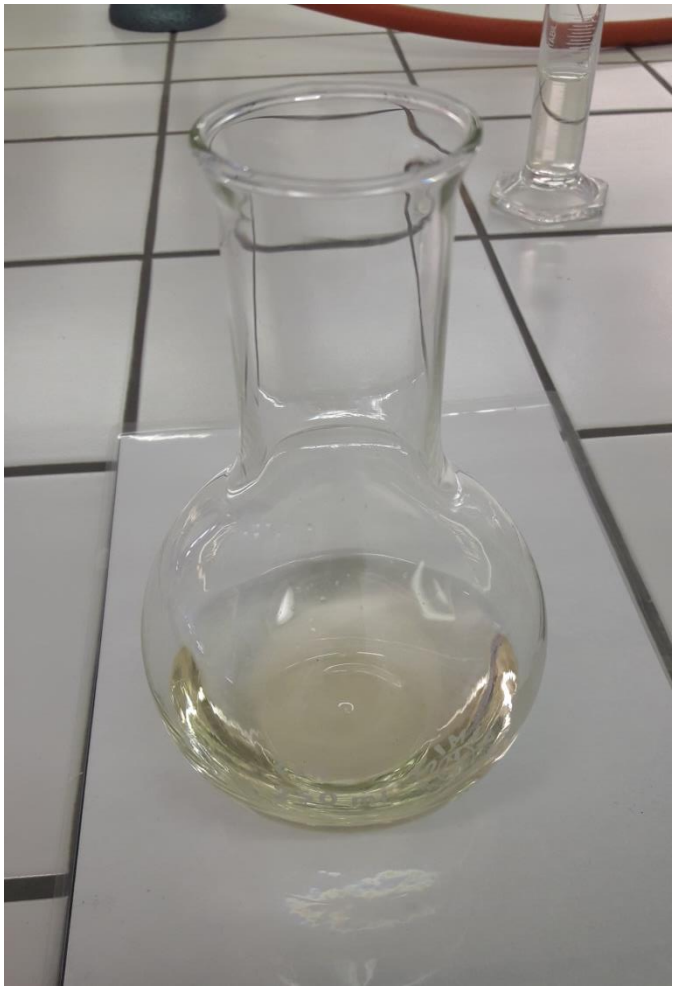






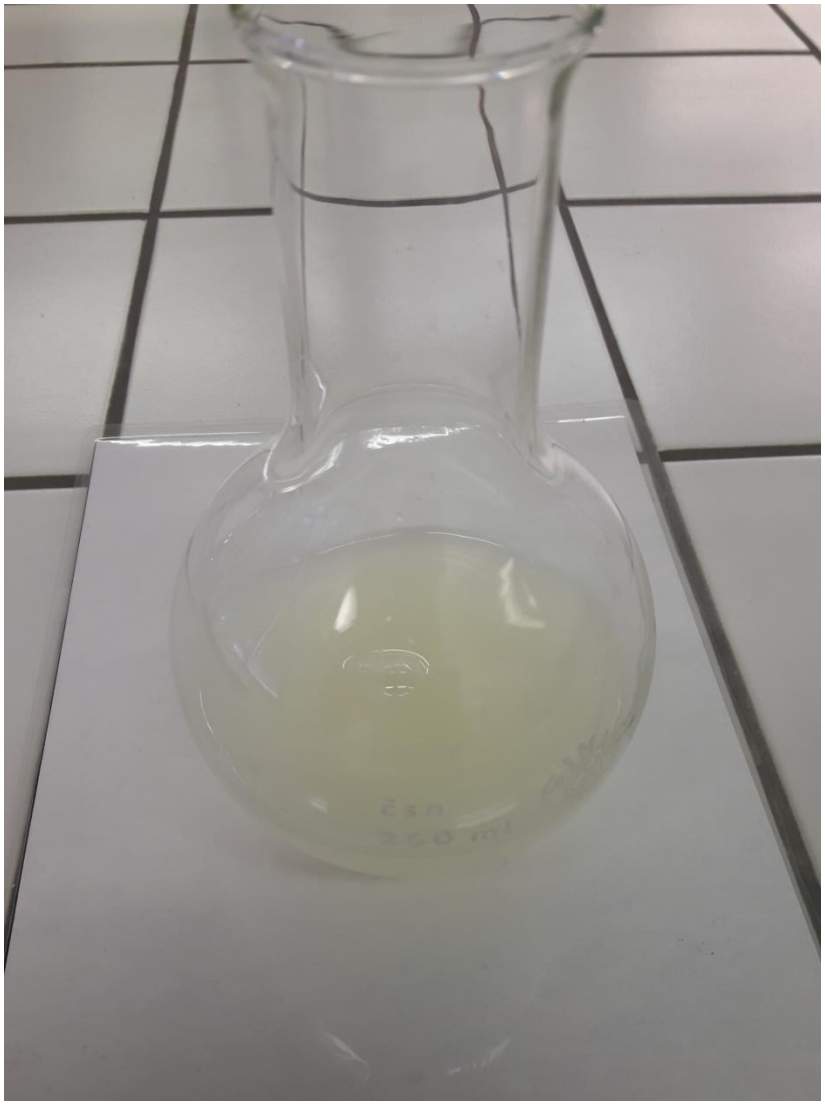
2. After dissolution, add 2 drops of methyl orange indicator (pink color) and titrate with a standard solution of NaOH until pale yellow, that corresponds to consumption of 0.2 to 0.5 ml before the equivalence point.



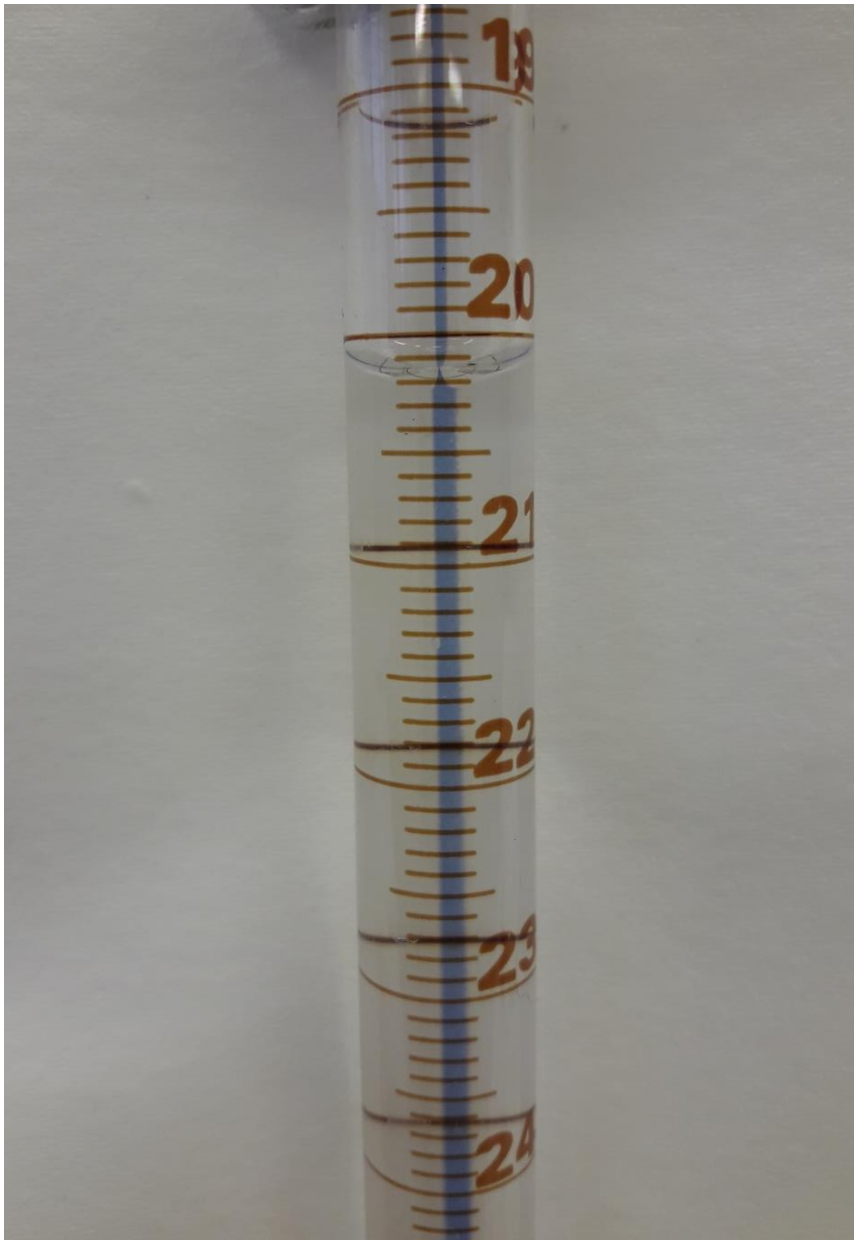


3. Add about 15 ml of $CaCl_2$ solution under continuous stirring, while pink color is restored and a precipitate (turbidity) is observed.

3. Titrate until the pink color of the suspension disappears.



4. Record the consumption from the burette and calculate the exact concentration of NaOH solution. Repeat the standardization 3 times and final concentration calculate as arithmetic mean.

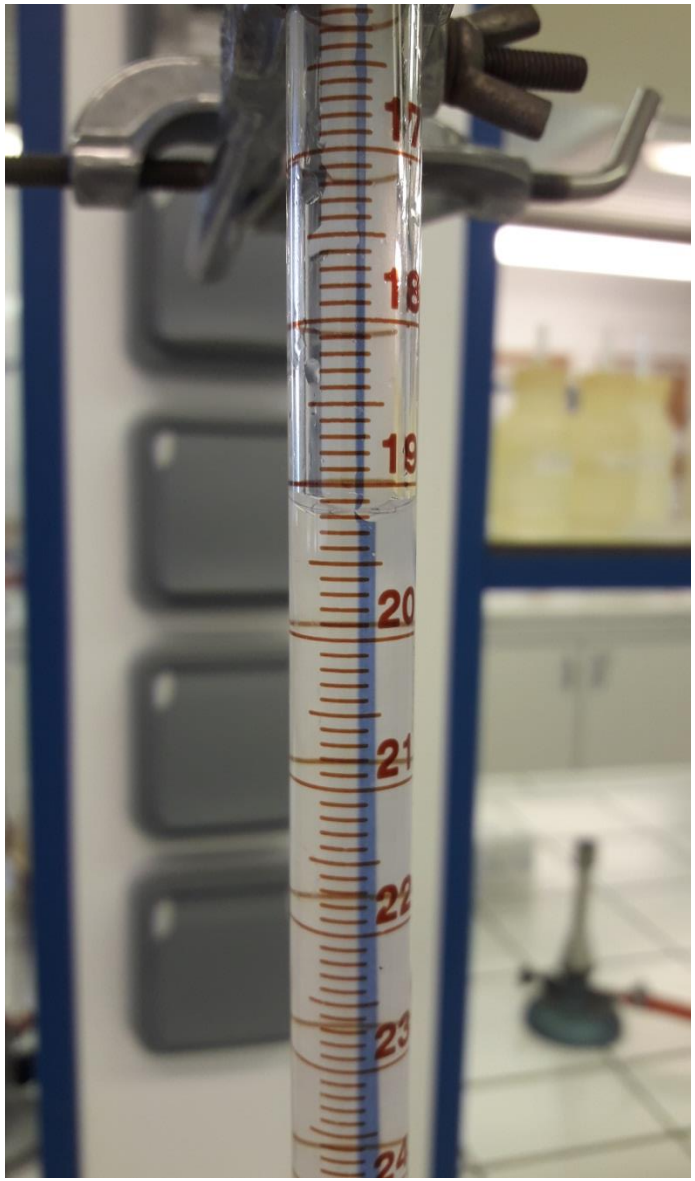


Determination of acetic acid content in vinegar:

1. Pipette 4 ml of vinegar into the titration flask, add 100 ml of deionized water and 3 drops of indicator phenolphtalein

2. Titrate with the volumetric solution NaOH to purple color.

3. Record the consumption from the burette and calculate the mass fraction of acidic acid in vinegar sample. Whole determination repeat 3 times. The final result is calculated as arithmetic average from three measurements.



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Project partners

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