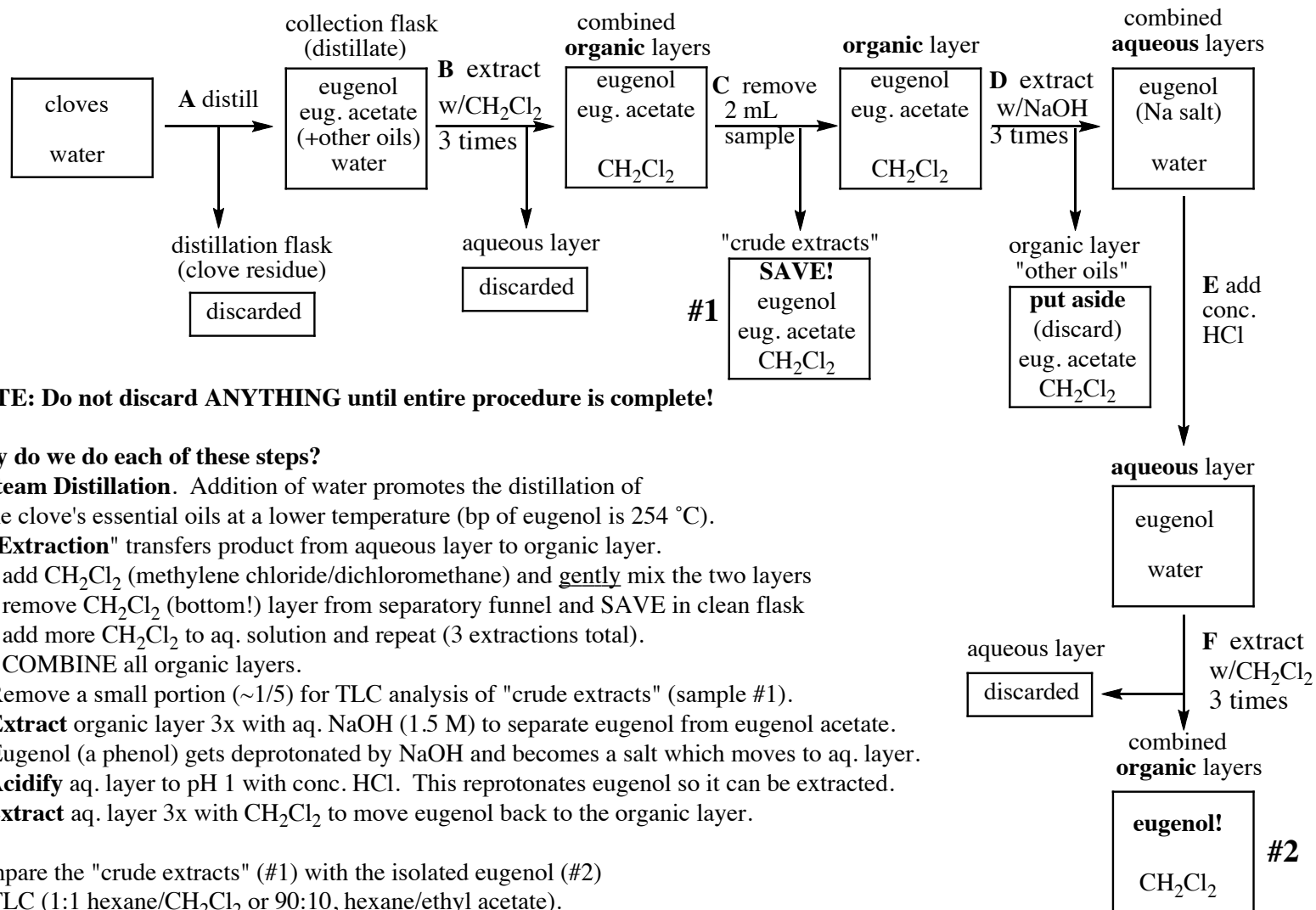
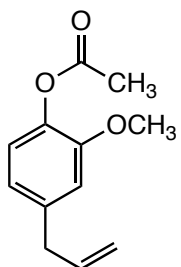
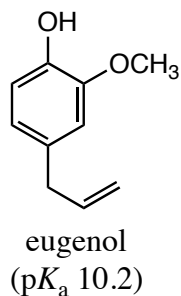


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Isolation of Eugenol from Cloves



NOTE: Do not discard ANYTHING until entire procedure is complete!

Why do we do each of these steps?

A Steam Distillation. Addition of water promotes the distillation of the clove's essential oils at a lower temperature (bp of eugenol is 254 °C).

B "Extraction" transfers product from aqueous layer to organic layer.

- add CH_2Cl_2 (methylene chloride/dichloromethane) and gently mix the two layers
- remove CH_2Cl_2 (bottom!) layer from separatory funnel and SAVE in clean flask
- add more CH_2Cl_2 to aq. solution and repeat (3 extractions total).
- COMBINE all organic layers.

C Remove a small portion (~1/5) for TLC analysis of "crude extracts" (sample #1).

D Extract organic layer 3x with aq. NaOH (1.5 M) to separate eugenol from eugenol acetate.

Eugenol (a phenol) gets deprotonated by NaOH and becomes a salt which moves to aq. layer.

E Acidify aq. layer to pH 1 with conc. HCl. This reprotonates eugenol so it can be extracted.

F Extract aq. layer 3x with CH_2Cl_2 to move eugenol back to the organic layer.

Compare the "crude extracts" (#1) with the isolated eugenol (#2) by TLC (1:1 hexane/ CH_2Cl_2 or 90:10, hexane/ethyl acetate).

Did this acid/base extraction technique successfully separate eugenol from the other essential oils?

Flash-based complete extraction tutorial:



Please review the Extraction tutorial, especially the section on Planning an Acid-Base Extraction (<http://tiny.cc/u43djy>).

(all lab technique tutorials can be found at <https://www.youtube.com/user/ChemistryConnected>)

Extraction playlist acid-base is Part 7:

