

Lab Set-Up:

• Materials

- hot plate
- H_2SO_4 pipette
- ethanol ($\text{C}_2\text{H}_5\text{OH}$)
- 50 mL beaker
- boiling stones
- acetic acid (CH_3COOH)
- 2 test tubes
- 30 mL water
- butyric acid ($\text{C}_4\text{H}_8\text{O}_2$)
- 2 plastic pipettes
- butanol ($\text{C}_4\text{H}_9\text{OH}$)
- H_2SO_4

• Purpose

to change one smell into another

• Procedure

- 1) Fill 50-mL beaker w/ 30 mL of water, put a boiling stone in it & bring to gentle boil on hot plate.
- 2) In test tube #1, add 5 drops of acetic acid. Waft & record smell.
- 3) In test tube #2, add 5 drops of butyric acid. Waft & record smell.
- 4) In test tube #1, add 10 drops of butyl alcohol. Waft the alcohol vial & record.
- 5) In test tube #2, add 10 drops of ethyl alcohol. Waft the alcohol vial & record.
- 6) Add 1 drop of H_2SO_4 to each test tube & add a boiling stone.
- 7) Carefully waft each test tube & record smell.
- 8) Place plastic bulb "seal" on top of each test tube, place test tubes in boiling water & heat for 5-10 min.
- 9) After 5-10 min. remove pipette from water, carefully waft ~~over~~ substance in test tube & record new smell.
- 10) Dump test tube substances into proper waste containers.
- 11) Clean up area for next class.

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Data Results

• Data Table:

Test tube	Smell of Acid	Smell of Alcohol	Smell of Mixture	Smell After Rxn
1	putrid	camphor	putrid	Sweet
2	putrid	camphor	putrid	Sweet

• Smell Chemical Rxns

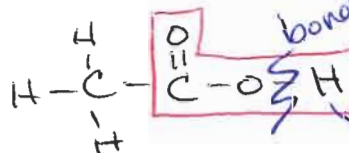
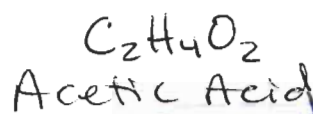
* Test tube #1:

Molecular Formula:
Name:

Structural Formula:

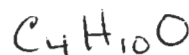
Functional Group:

Smell:

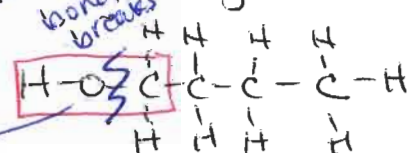


Carboxylic Acid

Putrid

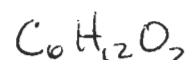


Butyl Alcohol

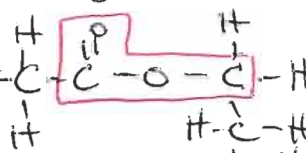


Alcohol

Camphor



Butyl Acetate



Ester

Sweet

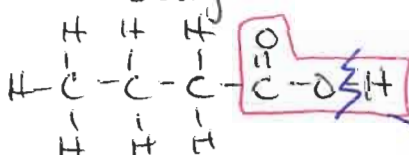
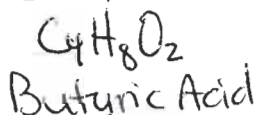
* Test tube #2:

Molecular Formula:
Name:

Structural Formula:

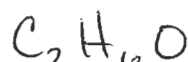
Functional Group:

Smell:

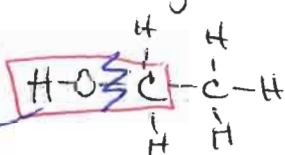


Carboxylic Acid

Putrid

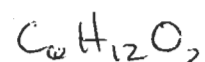


Ethyl Alcohol

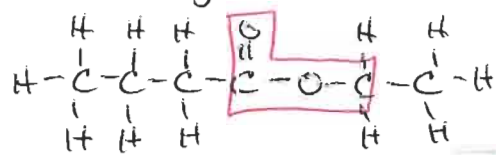


Alcohol

Camphor



Ethyl Buterate



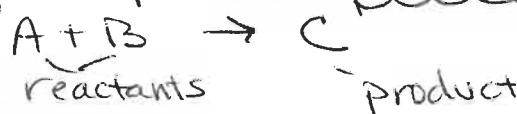
Ester

Sweet

Making Sense Notes: (complete while students are heating test tubes)

• What are chemical rxns?

- a chemical change that occurs when substances interact to produce new substances w/ new properties
 - happens @ the site of functional groups
 - bonds break & new ones form
 - starting ingredients = reactants
 - ending compounds = products



- catalyst = speeds up a chemical rxn but itself is NOT used in the rxn
 - our lab catalyst = H_2SO_4

• What functional group is related to the Camphor smell?

* Functional group = Alcohol

• Structure = $-\overset{\text{H}}{\underset{\text{H}}{\text{C}}}-\text{O}-\text{H}$

• chemical name ends in "-ol"

* Functional group = Alkane

• Structure = $-\overset{\text{H}}{\underset{\text{H}}{\text{C}}}-$ ONLY has C & H

• smells like gasoline

• chemical name ends in "-ane"