# Chem 2

Etienne Herzig

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# 1 Overview

## 1.1 Grading

Only the better two tests get counted and make up 80% of the grade. Homework & Assignments should be submitted within online within two weeks and make up 20% of the grade. A bonus of  4% can be earned with consistent presence

## 1.2 Test Dates

9.11.2022
14.12.2022
25.01.2023

# 2 Lessons

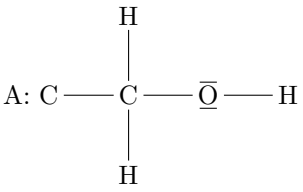
## 2.1 Lesson 1 - 21.09.2022

Revision of principles learned in Chem 1, which bear relevance in Chem 2. Important things to remember:

- 1. Distinction Atom / Molecule
- 2. Polar / Non Polar
  - A molecule is polar if the majority of bond in said molecule are polar. A bond is polar if one Atom in the bond has a higher electronegativity.
  - Important Polar Bonds
    - C - O
    - O - H
    - N - H
  - Important Non-Polar Bonds
    - C - C
    - C - H
  - Boiling Points are related to the intermolecular bond strength. (The higher the bond strength between molecules the higher the boiling point)
  - There are three relevant intermolecular bond forces ( here ranked by strength from weakest to strongest )
    - Van der Walls forces
      Occurs in unpolar bonds.
      Unpolar molecules gain in bond strength the longer the "chain" of the molecule and the less "branched" it is.
    - The Dipol-Dipol Force
      Occurs in polar bonds
    - Hydrogen Bond ( Wasserstoffbrücken )
      Occurs in polar bonds involving a Hydrogen Atom (Overrules the Dipol-Dipol Force)
- 3. SP3 Hybridisierung
  - the S1 Orbital can be combined with the P Orbital to form the SP3 Orbital which is on a single energy level.

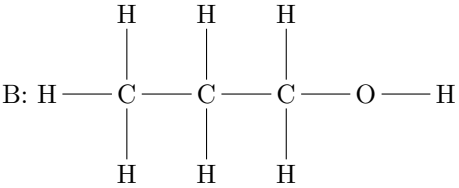
Examples:

- A:



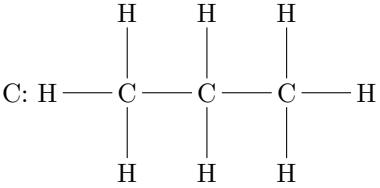
  - A Has 3 Non Polar Bonds ( C-C, C-H, C-H )
    and 3 Polar Bonds ( C-O, C-H ) and is therefore Non-Polar.

- B:



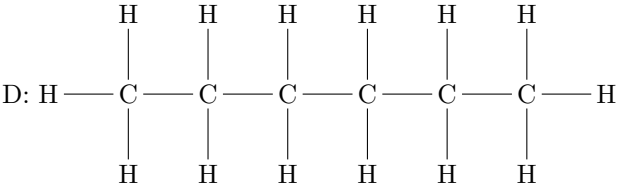
  - B has 7 Non Polar Bonds ( C-H * 7 )
    and 2 Polar Bonds ( C-O, O-H ) is therefore Non-Polar. ( more than A)

- C:



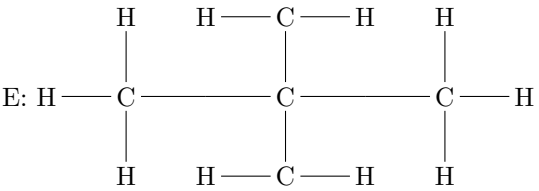
  - C has 10 Non Polar Bonds ( C-H * 7 ) and 0 Polar Bonds and is therefore exclusivly Non-Polar.

- D:



  - D has 19 Non Polar Bonds ( C-C * 5, C-H * 14) and is therefore exclusivly Non-Polar.

- E:



  - E has 19 Non Polar Bonds ( C-C * 5, C-H * 14) and is therefore exclusivly Non-Polar.
    It however has a lower boiling point than item D, because the Van der waals bonds are weaker when more "nested".