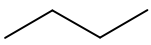
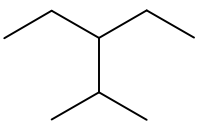
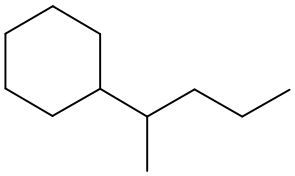
# Functional Groups – Families of Organic Compounds

- a functional group is a frequently observed arrangement of atoms
- frequently observed because it meets certain stability requirements (see thermodynamics and the potential energy hill)
- reactivity is based on functional group hence grouping makes sense
- nomenclature is based on functional groups

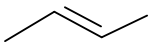
1. Alkanes

   - lack of a functional group
   - straight chain
   - branched chain
   - rings
   - combination of the above

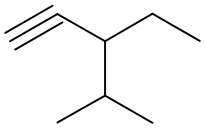
2. Alkenes

   double bond



3. Alkynes

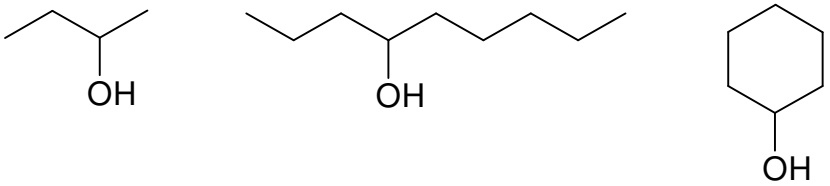
   triple bond



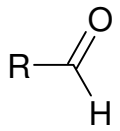
4. Alcohols (format using R place holder notation – R is like a variable in math that take the place of either a carbon chain or a hydrogen)

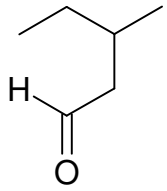
   R–OH

   R = carbon chain, R ≠ hydrogen

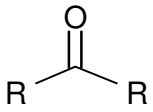


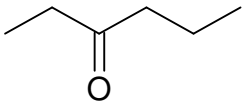
5. Aldehyde



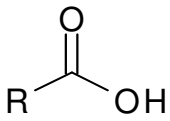

6. Ketone

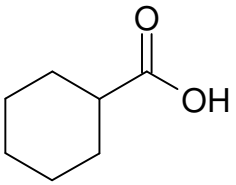


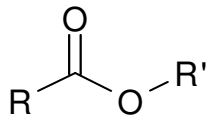

R ≠ hydrogen

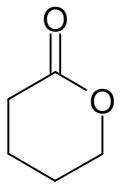
7. Carboxylic Acid



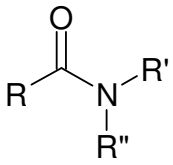
8. Ester

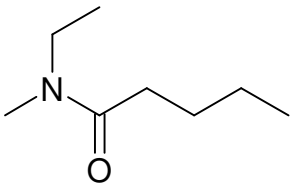


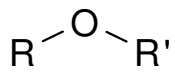

R′ ≠ hydrogen

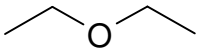
9. Amide




10. Ether




R,R′ ≠ hydrogen

11. Amine