

Source: [KBiologyMasterIndex](#)

1 | Bio-Molecules Quiz Review

1.1 | Paul's Review Sheet

... is here

And Jack's raw answers: [KBhBIO201BioMoleculesRAW](#)

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Enzymes are catalysts. They speed reaction rates but do not affect the change in free energy of the reaction (the difference in potential energy between reactants and products).

- Activation energy is the amount of kinetic energy required to reach the transition state of a reaction.
- Enzymes speed up a reaction by lowering the activation energy, often with the help of cofactors or coenzymes.
- **Enzymes lower the activation energy by some combination of...**
 - Orienting the reactions substrate(s) to promote more effective collisions (and therefore reactions)
 - Stressing or straining bonds to temporarily and/or slightly lower the strength of attraction to allow the bond to break more easily
 - Involving amino acid R-groups or sidechains in creating the transition state between reactants and products

Enzymes have active sites that bring substrates together and may change shape to stabilize the transition state; known as Induced Fit upon binding active site and slight change in enzyme shape.

Most enzymes are proteins, and thus their activity can be directly influenced by modifications or environmental factors, such as temperature and pH, that alter their three-dimensional structure.

Enzyme activity may be regulated/inhibited by molecules that compete with substrates to occupy the active site (competitive inhibitor) or alter enzyme shape so that substrates become unable to enter the active site (non-competitive inhibitor).

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1.2 | Helpful review items

Bonding in organic compounds, a review.

Common nonpolar bonds

Carbon-carbon
Carbon-hydrogen
Carbon-sulfur

Common dipole interactions

Carbon-nitrogen $\delta^+ - \delta^-$ Carbon-oxygen $\delta^+ - \delta^-$
Nitrogen-oxygen $\delta^+ - \delta^-$ Hydrogen-oxygen $\delta^+ - \delta^-$

Common ionic interactions

they come from acid-base interactions.

However, sometimes they are permanent. Look at the amino acid chart for those.

Why hydrogen bonding is excellent

Hydrogen bonding allows stronger dipole-dipole bonds than dipole-dipole bonds. They are still good ol covalent bonds.

These bonds basically combines Hydrogen w/ the most electronegative atoms.



Reading a line-angle representation.



In this type of representations, start with a line. End the line at every carbon.



Now, it is assumed that carbon is not going to just be happy with $\text{C}-\text{C}-\text{C}-\text{C}$.



So, we still the missing orbitals with hydrogen.

need 2
 $\text{C}-\text{C}-\text{C}-\text{C}$ ← need 3
↑ need 2
need 3

Figure 1: Screen Shot 2020-10-09 at 11:58:55 AM.png

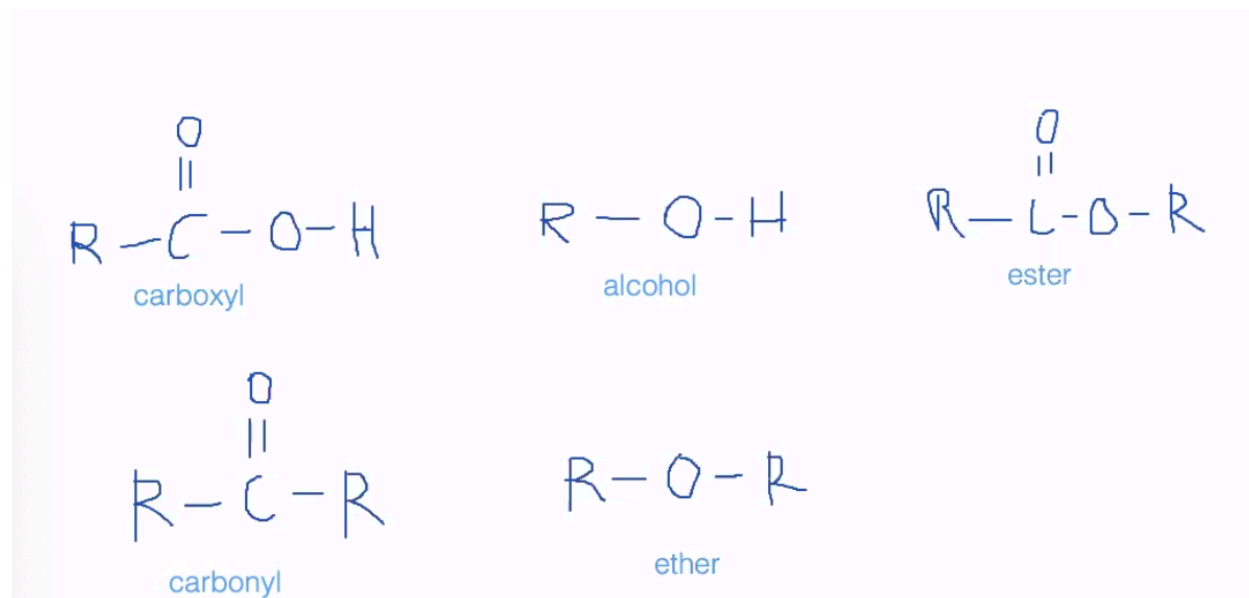


Figure 2: Screen Shot 2020-10-12 at 2.34.16 PM.png