

October 24, 2007

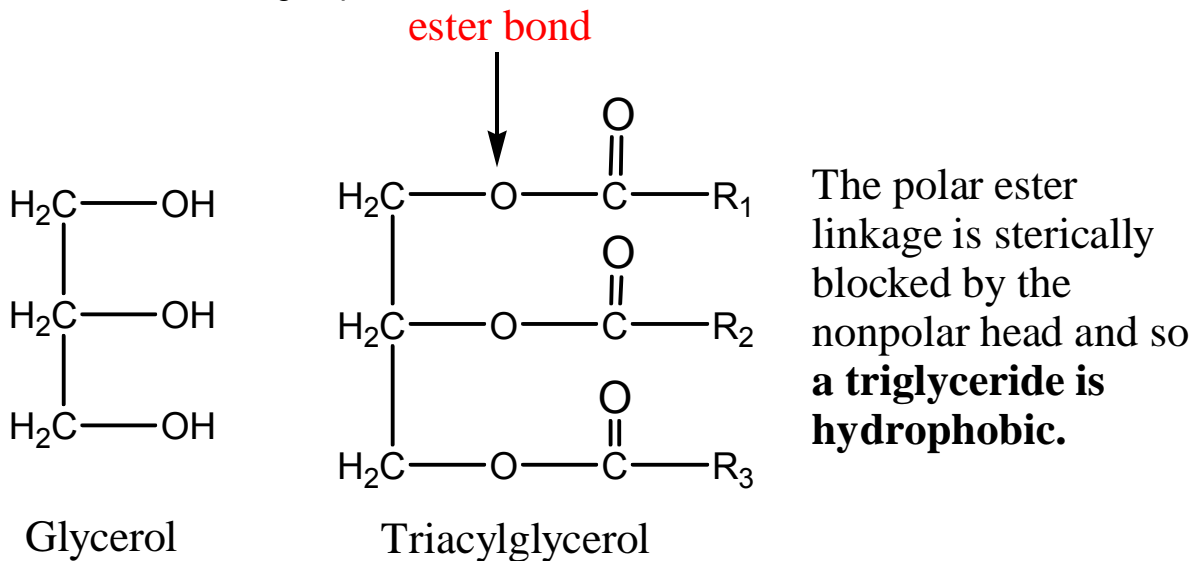
- ⊕ lipids have a polar head (COOH) and a nonpolar tail
- ⊕ the head exists protonated at pH<4
- ⊕ saturated lipids have no double bonds (they're saturated with H's) and are linear
  - have suffix: *-noic*
- ⊕ unsaturated lipids have one or more double bonds and are bent
  - have suffix: *-enoic*
- ⊕ lipid designation (example 18:1Δ9)
- ⊕ ω designation (count back from last C)
- ⊕ London forces among the nonpolar tails of lipids increase with:
  - Size
  - Similar shapes
  - Close proximity

Maybe should know (I'm not gonna focus on it)

- ⊕ Linoleic acid and α-linoleic acid are essential fatty acids

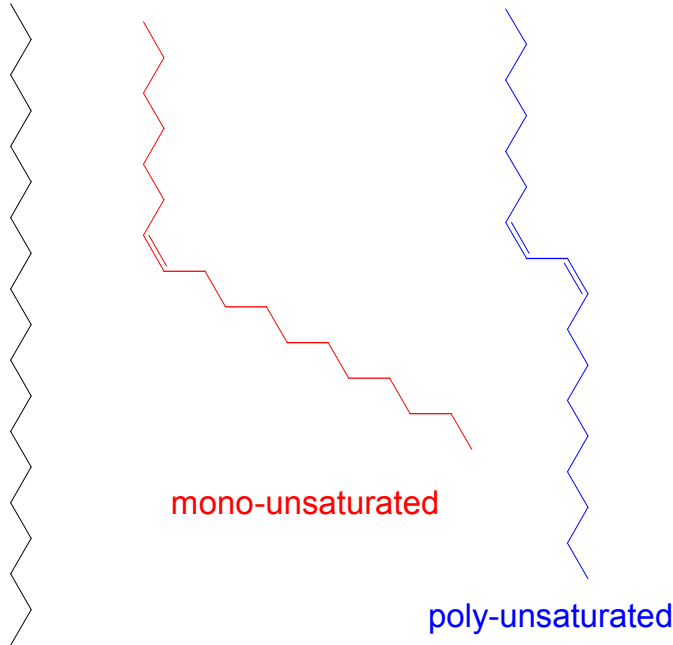
October 26, 2007

- ⊕ **Hydrogenation:** C=C → C-C
- ⊕ Triacylglycerol (=triglyceride) is a derivative of glycerol.
  - Each of the R groups can be either saturated or unsaturated.



- ⊕ Saturated lipid structures (ex. Butter, lard) are called “fats” and are solids at room T.
- ⊕ Unsaturated lipid structures (ex. Olive oil) are called “oils” and are liquids at room T.
- ⊕ The more double bonds the less viscous (thinner) the liquid.

Ex. Which of the following structures would be solid at room T? Which would be the thinnest liquid?

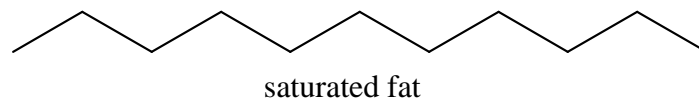


As said above, at room T  
\*\*Saturated fats are solid.  
\*\*Unsaturated fats are liquids.

So the left most structure is a solid.  
The middle structure is a thicker liquid.  
The right structure is a thin liquid.

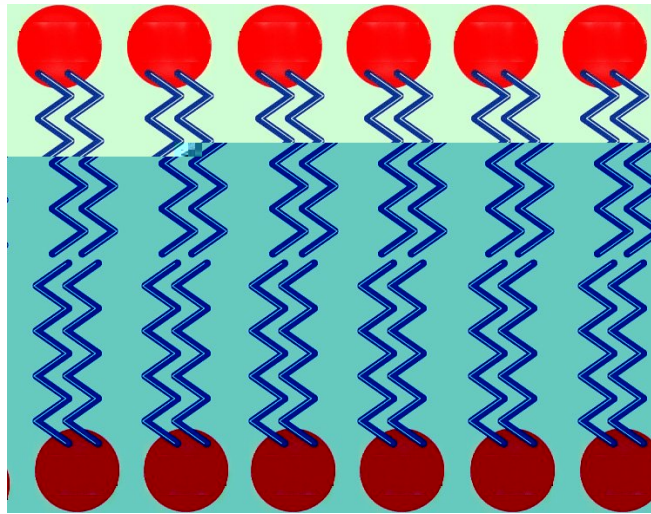
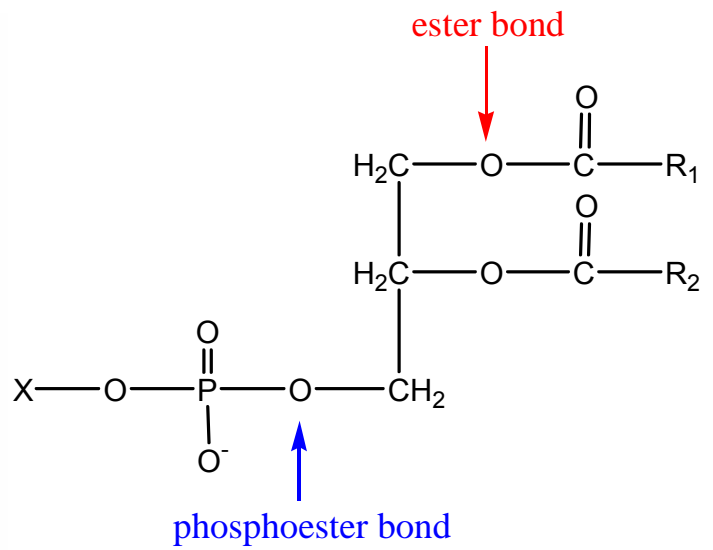
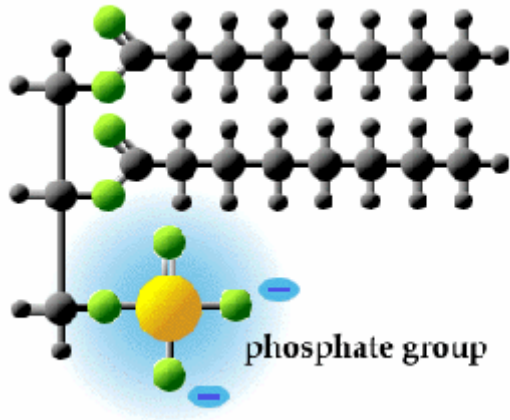
saturated

- ⊕ Nutritionally, mono- and diglycerides are not considered fats (i.e. their info doesn't need to be put on labels)
  - However, they do breakdown in the GIT and reform triglycerides.
- ⊕ *Trans* fats are artificially made (ex. margarine).
  - Initially thought to be better than saturated fat due to the presence of double bonds,
  - but the *trans fats* act like saturated fats and raise LDL cholesterol more than sat. fats

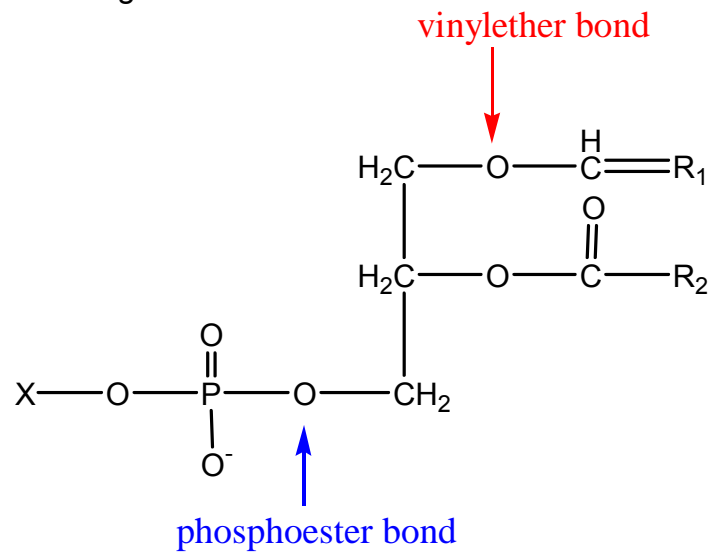


- ⊕ Base hydrolysis (saponification) produces the salts of fatty acids and glycerol.
- ⊕ Lipases selectively cleave bonds and remove fatty acids from glycerol structure.
- ⊕ Glycerophospholipids of a glycerol molecule where
  - C<sub>1</sub> & C<sub>2</sub> = fatty acids & C<sub>3</sub> = phosphate group with a head group
  - Amphipathic
  - Head groups are polar or charged

## Phospholipid



⊕ Plasmogens are found in blood and differ from phospholipids due to the presence of a vinyl ether instead of an ester linkage.



⊕ Lipases cleave bonds in fatty acids and yield alcohols at the cleaving point.

