Organic Chemistry Review

1. Organic compounds must contain Carbon (and usually H), they are molecular compounds.
2. Carbon always makes 4 covalent bonds (wide variety of compounds).
3. Molecular formulas show exact numbers of atoms in a compound.
4. Structural formulas show the bonding arrangement of atoms.
5. Empirical formulas show lowest whole number mole ratio of atoms.
6. Hydrocarbons contain only C & H (table Q).
7. Saturated hydrocarbons contain only single carbon to carbon bonds (alkanes).
8. Unsaturated hydrocarbons have 1 double or triple carbon to carbon bond (alkenes & alkynes).
9. Properties of organic compounds:
   A. low melting points and boiling points, weak imf’s.
   B. melting points/boiling points increase with mass (imf’s increase with size).
   C. slow reaction rates due to strong covalent bonds.
   D. Catalysts are used to speed up organic reactions (enzymes).
   E. Hydrocarbons are always non polar and do not dissolve well in water.
10. Isomers are compounds with the same molecular formula but a different structure. They have different properties due to differences in structure.
11. The greater the number of carbon atoms the greater the number of isomers; minimum of 4 C’s needed for a different structural arrangement.
12. Use table P and R to name hydrocarbons.
   A. alkanes – end in ane  B. alkenes - end in ene  C. alkynes - end in yne.
   Meth = 1 C   Eth = 2 C   Prop = 3 C   But = 4 C.
13. Functional groups give rise to unique properties. Table R lists functional groups.
14. Alcohols are the most common nonelectrolyte.
15. Esters smell good. Esterification is organic acid + alcohol → ester + water.
16. Organic acids are weak electrolytes (COOH).
17. Alkanes + halogen = substitution reaction.
18. Alkenes (ynes) + halogen = addition reaction (the double bond breaks and they become saturated).
19. Fermentation sugar → (ethanol) C₂H₅OH + CO₂.
20. Saponification fat + base → soap + glycerol.
22. Polymerization makes long chained molecules from smaller units (monomers).
23. Fractional distillation is used to separate mixtures of hydrocarbons (petroleum) due to differences in boiling points.