Section 5.1 Acids and Bases

What is an Acid?

- Defined by its behavior!
- A molecular compound (2 or more non metals)
- When dissolved in water it conducts electricity
- It reacts with metals to produce hydrogen gas
  e.g. $Zn + 2HCl \rightarrow H_2 + ZnCl_2$
- It reacts with carbonates to produce CO_2 gas
  e.g. $HBr + NaHCO_3 \rightarrow NaBr + H_2O + CO_2$
- Reacts with bases to produce water and a salt
  (salt = ionic compound)
- Sour tasting
- Feels like water
- Most acids contain hydrogen atoms but all of them release or produce hydrogen ions when dissolved in water
  e.g. $HCl_{(aq)} \rightarrow H^+_{(aq)} + Cl^-_{(aq)}$
- It is the free hydrogen ion (proton) that gives acids their characteristics
- They are corrosive "burn" (reacts with organic material)
- They have a pH less than 7
- Turn litmus paper red

What is an Base?

- Defined by its behavior!
- An ionic compound (metal and non metal)
- When dissolved in water it conducts electricity
- It does not react with metals
- It does not react with carbonates
- Reacts with acids to produce water and a salt
  (salt = ionic compound)
- bitter tasting
- feels slippery
- Most bases contain hydroxide ions but all of them release or produce hydroxide ions when dissolved in water
  e.g. $NaOH_{(aq)} \rightarrow Na^{+}_{(aq)} + OH^{-}_{(aq)}$
- It is the free hydroxide ion that gives bases their characteristics
- Bases react with proteins to break them down (drain cleaner dissolves hair in a clogged sink)
- They have a pH greater than 7
- Turn litmus paper blue

NAMING ACIDS

- The formula of an acid always has the hydrogen written first

- Binary acids start with the name Hydro – and then end with the nonmetal changing its ending to “ic” and then adding the word “acid”

- Polyatomic acids with oxygen have the remaining non metal identified and the ending changing to “ic acid”

NAMING BASES

- Formula starts with a cation (metal ion or ammonium ion) and ends with hydroxide “OH”

- Name the base following the same rules as ionic compounds