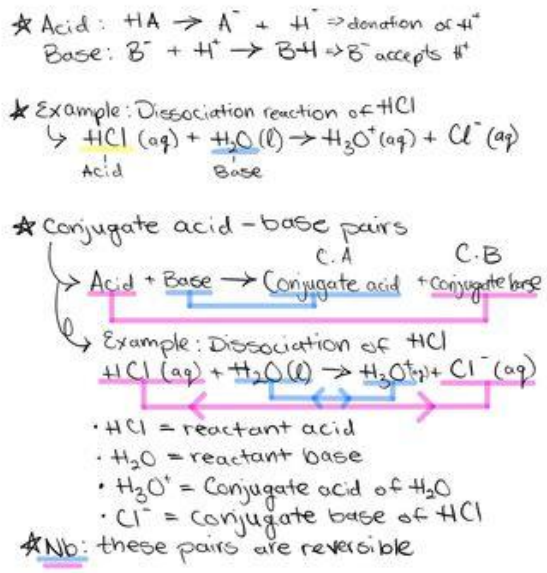
Brønsted–Lowry theory of acids and bases:

- An acid is a chemical species that, in solution, donates a proton
    - H(+) is seen as a proton
- Bases are chemical species that, in solution, accepts a proton (H+)



Water as an acid and a base

- Depending on the reaction, water can be an acid, base, or a product.
- Water as a base —> Example: The dissociation reaction of Hydrochloric acid (HCl)
    - HCl (aq) + H2O (l) —> H3O(+) (aq) + Cl(-) (aq)
    - In this case, water accepts a proton from HCl to create Hydronium ions

Water as an acid

- H2O (l) + NH3 (aq) —> NH4(+) (aq) + OH(-) (aq)
    - in this case, water donates a proton to ammonia (NH3) in order to create ammonium ions (NH4+)

Water as a product of a reaction —> created in some acid-base reactions:

- • CH3COOH (aq) + OH(-) (aq) —> CH3COO (-) (aq) + H2O (l)
- • Acetic acid reacts with hydroxide to create acetate and water

Conjugate acid-base pairs

- Reactant acids become conjugate bases in products
- Reactant bases become conjugate acids in products
- In each acid-base reaction, there will be two conjugate pairs

Amphiprotic species

- An amphiprotic species can accept or donate protons (H+)
- Water is an amphiprotic species since it can accept protons to become H3O+ or donate protons to become OH-

Strong acids and strong bases

- Strong acids completely dissociate into ions in solutions and all protons are donated to base
    - Some common strong acids:
        - HCl, HBr, H2SO4, HI, HClO4, HNO3
- Strong bases completely dissociate into ions in solutions and generate OH- ions from reactant bases
    - Some common strong bases:
        - NaOH, LiOH, KOH, Ca(OH)2, Ba(OH)2