Acid/Base Equilibria Unit 4

Text – Chapters 14 + 15

Definitions of A + B

1. Common — Acid: sour; Base: bitter

2. Arrhenius — H^+: e.g. HCl, CH_3COOH, HNO_3; OH^-: e.g. NaOH, $Ca(OH)_2$

3. Brönsted-Lowry — proton (H^+) donor; proton receiver

Identify – proton donors – receivers
– conjugate acid-base pairs

e.g. $NH_{3(g)} + H_2O_{(l)} \rightleftharpoons NH_{4(aq)}^+ + OH_{(aq)}^-$
Base Acid Conjugate acid conjugate base

e.g. $CH_3COOH_{(l)} + H_2O_{(l)} \rightleftharpoons H_3O_{(aq)}^+ + CH_3COO_{(aq)}^-$
acid Base Conj acid conjugate base

Identify – Acid Base Conjugate pairs; hydronium ion; Water – amphoteric (both A + B)

Questions P. 557 # 1-7
Read text 549-557

Strong vs. Weak Acids/Bases (Demonstration)

Substance	Conductivity (light bulb)
Pure water	no conductivity
HCl acid	Good conductor
CH_3COOH (acid)	Poor conductor
NH_4OH (base)	Poor Conductor
NaOH (base)	Good conductor
NaCl (salt)	Good conductor

Conductor – must make ions (charges)
– charges must move

Conclusion – "Strong" means 100% ionization
– "Weak" means < 100% ioniz.

Using Equations to Communicate

1. Strong acid $HCl + H_2O \longrightarrow H_3O_{(aq)}^+ + Cl_{(aq)}^-$

2. Strong base $NaOH_{(s)} \longrightarrow Na_{(aq)}^+ + OH_{(aq)}^-$

3. Weak acid $CH_3COOH + H_2O \rightleftharpoons H_3O^+ + CH_3COO^-$

See list – p. 563