

Chapter 3 Summary: Acid/Base, Proton-Transfer Reactions (Klein)

I. Definitions (Sections 3.1, 3.2) **SkillBuilder 3.1**

- a. Lewis acid/base (3.10, e⁻ pair acceptor/donor, Electrophile/Nucleophile)
- b. Bronsted-Lowry acid/base (proton, H⁺, donor/acceptor)
- c. curved arrows to show reaction mechanisms

How can we predict relative strengths of acids and bases? (Sections 3.4, 3.5)

II. Periodic trends in acid strength (*ARIO: Atom*) **SkillBuilder 3.5**

- a. ROH > R₃CH and HI > HCl. Why? Compare conjugate bases...
- b. The stronger acid has the more stable (weaker) conjugate base!

III. Inductive effects on acid strength (*ARIO: Induction*) **SkillBuilder 3.7**

- a. electron-withdrawing groups (EWG) stabilize negative charges
- b. inductive effects decrease with distance

IV. Effect of resonance (*ARIO: Resonance*) **SkillBuilder 3.6**

- a. acid strength: resonance can stabilize a conjugate base
- b. base strength: resonance can tie up and stabilize a lone pair

V. Common acids (see pK_a Table 3.1) **SkillBuilders 3.2, 3.3, 3.4**

- a. use pK_a table to identify strong/weak/very weak acids (Section 3.3)
- b. determine direction of equilibrium (Section 3.6), with or without pK_a table

skip: ARIO-Orbital (skip SkillBuilder 3.8), 3.7 Leveling effect, 3.8 Solvating effect .

Suggested textbook problems (4th edition)

1-64, but skip 21, 22, 23dg, 24d, 30f, 32-36, 46c, 47d, 49a, 50, 51ac, 64c.