

Ch 8 Lecture Outline: *Mass Spectrometry*

(suggested problems: 1, 3, 4, 7oq, 10)

I. The Mass Spectrometer - Basic Instrumental Components

II. Key Features of the MS Experiment

- A. mass resolution
- B. ionization methods
 1. EI (electron impact)
 2. CI (chemical ionization)
 3. FAB (fast atom bombardment)
 4. electrospray
 5. MALDI (matrix-assisted laser desorption ionization)
- C. m/z filtering
 1. sector spectrometers (single and double focusing)
 2. quadrupole spectrometers
 3. time-of-flight spectrometers
 4. FT-ICR spectrometers

III. The Chemical Process

- A. Ionization
- B. Fragmentation

IV. MS Data Analysis

- A. general features
- B. typical MS analysis
 1. molecular ion identification
 2. $M+1$ analysis
 3. $M+2$ analysis
 4. nitrogen rule
- C. ion fragmentation - some common pathways
- D. McLafferty rearrangement

V. The Alabama MS Facility