Introduction to CHEM 51B

- **Second quarter of organic chemistry!!!**
- UCI academic honesty policy will be strictly enforced
  - Any instance or attempt will result in zero (F) grade and lead to a letter placed in your file.
- All cell phones must be silenced during class (includes lectures, discussions, office hours)
  - Cell phones are very disruptive and inconsiderate to your classmates

Introduction to CHEM 51B

- Instructor: **Sergey Pronin**
  - Reines Hall 5042A; spronin@uci.edu
  - Fixed office hour (2nd week): Thu 2:00 pm – 3:00 pm
  - Floating office hour (2nd week): I will honor the first request received after 10:50 am on Friday barring any conflicts with my prior commitments
  - Times and dates for the floating office hours will be emailed and posted on the website

Introduction to CHEM 51B

- TA: **Chris Discolo**
  - TBA; cdiscolo@uci.edu
  - Office hours: TBA
- TA: **Nick Foy**
  - TBA; nfoy@uci.edu
  - Office hours: TBA
- TA: **Alexandra Kent**
  - TBA; akent1@uci.edu
  - Office hours: TBA

Introduction to CHEM 51B

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Communication
Cite This: J. Am. Chem. Soc. 2018, 140, 16982−16987
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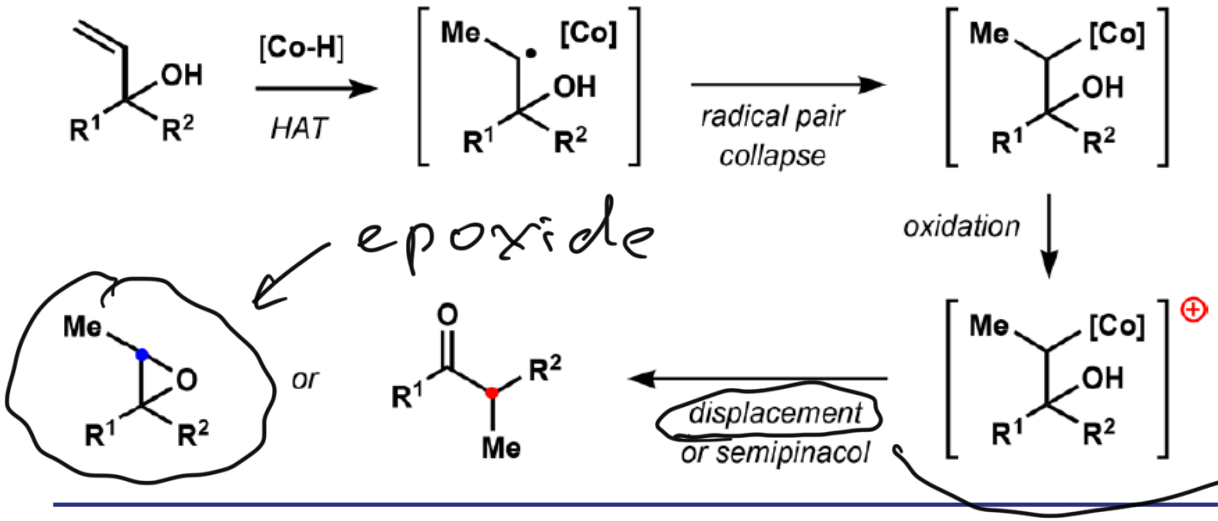
Catalytic Radical−Polar Crossover Reactions of Allylic Alcohols

Eric E. Touney, Nicholas J. Foy, and Sergey V. Pronin*

Department of Chemistry, University of California, Irvine, California 92697-2025, United States

Scheme 1. Proposed Participation of Alkylcobalt Intermediates



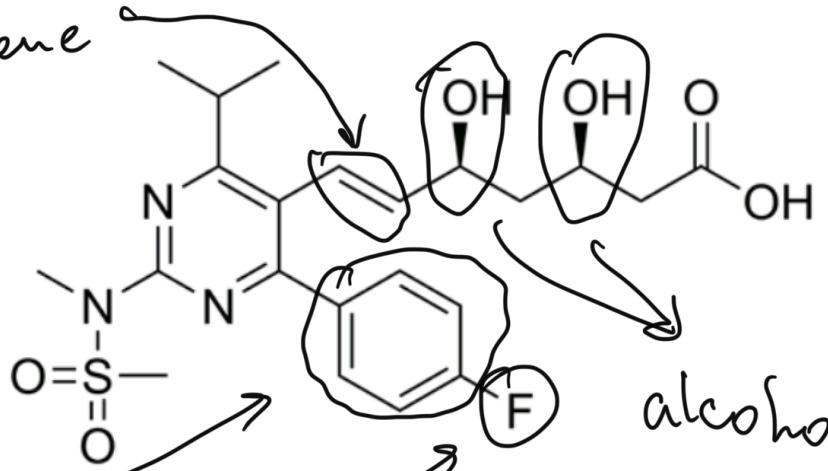
nucleophilic substitution

Introduction to CHEM 51B

20

Crestor

(Rosuvastatin)



block production of cholesterol

alkene

alcohols

benzene ring

halide

AstraZeneca

$3,401 Million

Cardiovascular Diseases

Introduction to CHEM 51B

- The best way to contact Chris, Nick, Alexandra, and myself is email, BUT:
- Do not ask chemistry questions by email: they will NOT be answered! Use office hours and discussions instead!
- Why? Neither the instructor nor the TAs can provide adequate explanations over email
- Begin the subject line with “CHEM 51B” to help us prioritize the class-related correspondence

Introduction to CHEM 51B

- Discussion sections (attend any one of the ten)
  - Mon: 9 am (#3, SSPA 1170), 11 am (#9, RH 188)
  - Tue: 3 pm (#4, HICF 100M)
  - Wed: 12 pm (#8, DBH 1200), 1 pm (#2, SSPA 1170)
  - Thu: 11 am (#1, RH 188), 3 pm (#6, HICF 100M)
  - Fri: 12 pm (#5, SSPA 1170), 1 pm (#10, PSCB 240), 2 pm (#7, HICF 100P)
- You will work on discussion worksheets (take notes!)

Introduction to CHEM 51B

- Extra credit can be earned by solving worksheet problems at the board during the discussion sections
- Each problem *solved correctly and explained clearly to the class* earns you extra 0.25% of your grade
- One problem per week can count towards the credit
- You can earn extra 1% of your grade per quarter
- More details will be available during the discussion sections

Introduction to CHEM 51B

- There will be three exams:
  - Midterm 1: Feb 1, during class, Chapters 7–9, 20% of your grade
  - Midterm 2: Mar 1, during class, Chapters 7–12, 30% of your grade
  - Final: Mar 18, 10:30 am, Chapters 7–12 and 15–17, 50% of your grade
- All exams are closed book and comprehensive

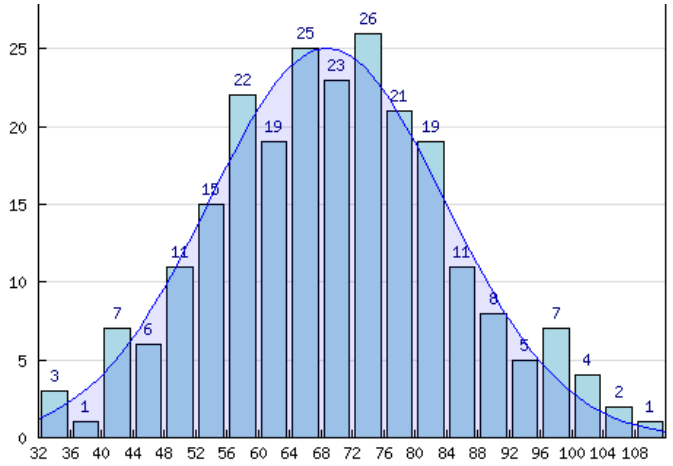
Introduction to CHEM 51B

- There will be three exams:
  - Assigned seating (see website before the exam)
  - Bring your student ID
- There are no makeup exams. Unexcused absences will count as zero.
  - The instructor must be notified in writing prior to the exam for any excused absences due to illness, etc.
- There may be more than one version of each exam

Introduction to CHEM 51B

- The curve:

  A - Excellent
  B - Good
  C - Average
  D - lowest passing grade



- *In a regular curve (and subject to change):*
  - The mean will be a C+
  - Mean + St. dev. ***approximately*** A/B cutoff
  - Mean - St. dev. ***approximately*** D/F cutoff

Introduction to CHEM 51B

- No letter grades for midterms
- Exams will be scanned and returned by EEE
- If you see a grading error, within one week:
  - print your entire exam
  - attach a note “Please re-grade problem XYZ”
  - the entire exam may be evaluated for grading errors

Introduction to CHEM 51B

- UCI Disability Services Center provides services to students with documented permanent and temporary disabilities. Services include reasonable accommodations, auxiliary aids, and individualized support services based on your disability documentation, functional limitations, and a collaborative assessment of needs. Testing accommodations are one specialized service that DSC provides.
- See: https://dsc.uci.edu

Introduction to CHEM 51B

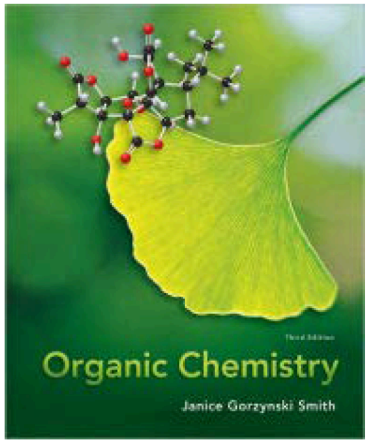
- How to be successful in this course (and other classes):
  - be organized
    - Schedule your week
    - Do ONE thing at a time
    - Do not procrastinate
  - understand course material
    - Simply memorizing chapters is not enough
    - If you have questions, ask!

Introduction to CHEM 51B

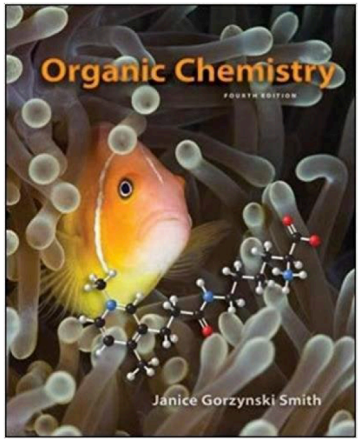
- How to study:
  - Attend lectures and *take your own notes* (don't only copy my writing and drawings!). THIS WILL SERVE YOU WELL. I will distribute my hand-written notes after each lecture.
  - Attend discussion sections and work through the worksheet problems. Work on your own (you will have the time), then double check (or correct) against the board.
  - Read the textbook. Read or skim before lecture and read and analyze again after the lecture.

Introduction to CHEM 51B

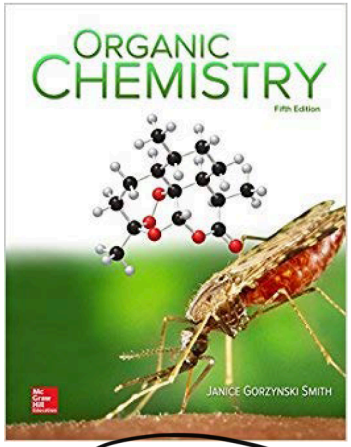
- Text:
  - **Organic Chemistry, 5th Edition**, by J. G. Smith
  - 3rd or 4th editions will work equally well



3rd edition



4th edition



5th edition

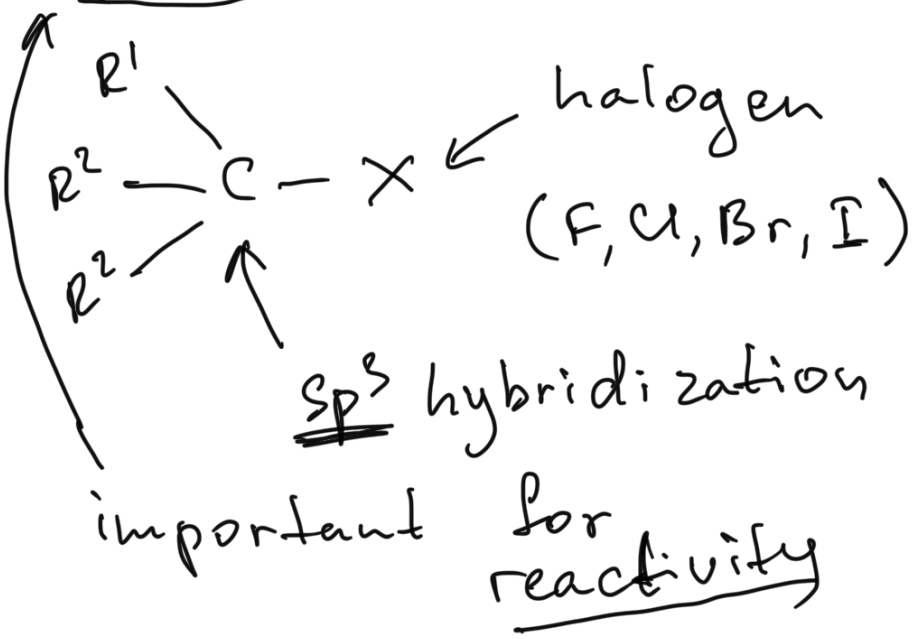
- We will follow the *material* of the textbook closely

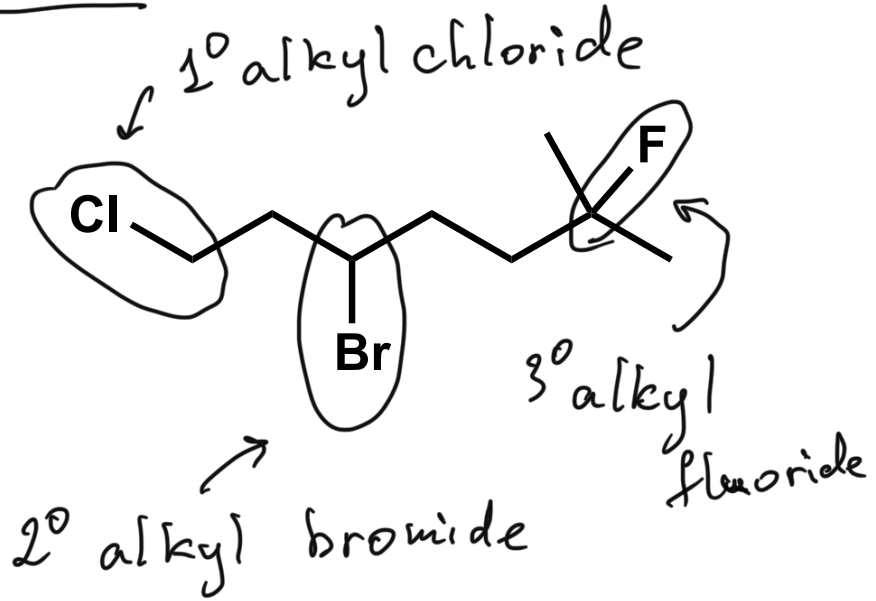
Introduction to CHEM 51B

- How to study:
  - Work the problems (in the textbook at the end of every chapter). Prioritize the assigned problems that will be posted on the website. Often times, it will be *all* of the problems at the end of the chapter.
  - Attend office hours. Be prepared with a list of questions.
  - *Free* chemistry tutoring: https://sites.uci.edu/ochemtutors/weiss-51a-40700/
  - LARC: http://www.larc.uci.edu/students/tutoring/

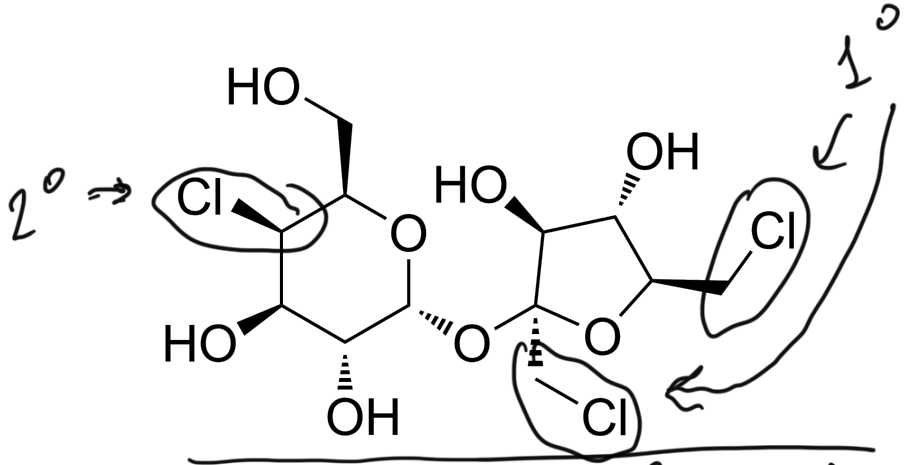
Alkyl halides

1°, 2°, 3°, allylic, benzylic

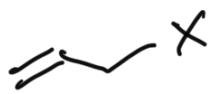




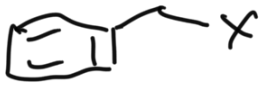
methyl halide



Sucralose, Splenda



allylic halide



benzylic halide

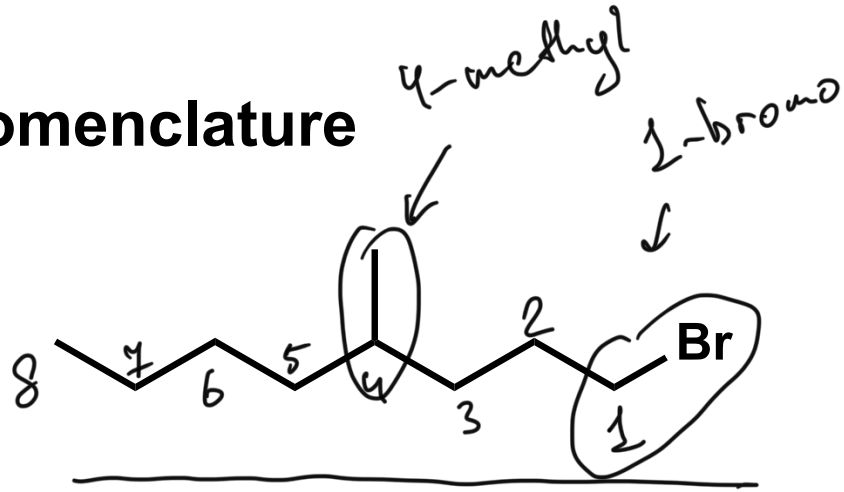
Alkyl halides: nomenclature

IUPAC, common names

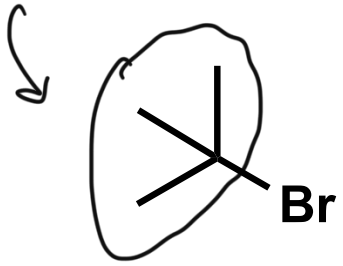
- octane

↓

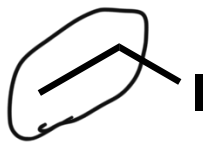
1-bromo-4-methyl octane



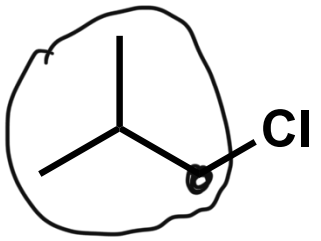
tert-butyl bromide



ethyl iodide

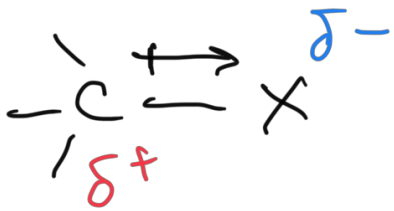


iso-butyl chloride



Alkyl halides: the polar C-X bond and reactivity

Nucleophilic subsitution, elimination

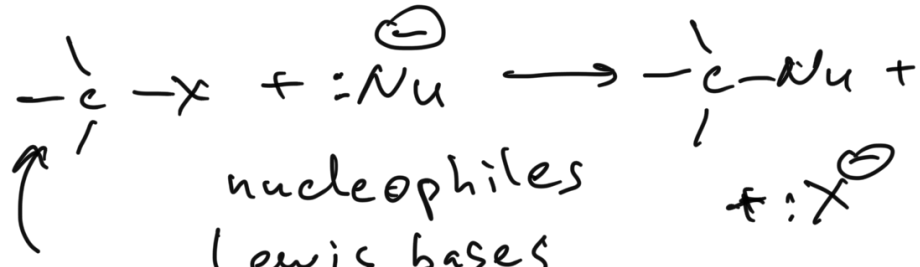


electrophilic

defines reactions

of alkyl halides

Substitution:

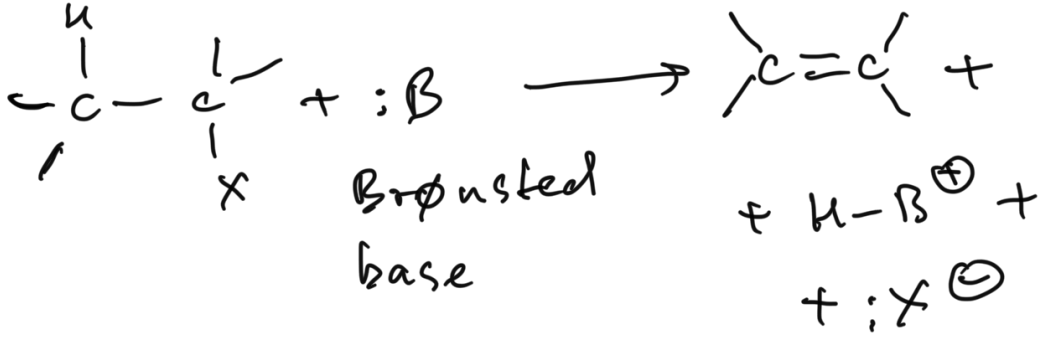


nucleophiles

Lewis bases

Lewis acid

Elimination:



Brønsted base

Alkyl halides: nucleophilic substitution

Leaving group, nucleophile, Lewis acids and bases

Alkyl halides: nucleophilic substitution

Charged and neutral nucleophiles, proton transfer

Nucleophilic substitution: the leaving group

Basicity and leaving group ability

Nucleophilic substitution: the leaving group

Starting material	Leaving group	Conjugate acid	pK_a
		H_2O	15.7
		H_3O^+	-1.7
		H_2S	7.00
		HBr	-9.00
		HCl	-8.0
		HF	3.17
		NH_3	38
		CH_4	48

Nucleophilic substitution: the nucleophile

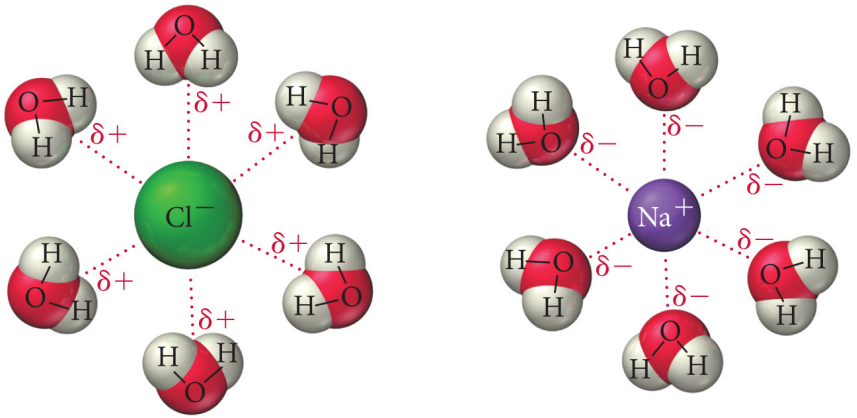
Comparison of bases and nucleophiles, basicity and nucleophilicity

Nucleophilic substitution: the nucleophile

Steric effects and nucleophilicity, effect on basicity

Nucleophilic substitution: the nucleophile

Polar protic solvents, solvation of cations and anions, effect on nucleophilicity



Nucleophilic substitution: the nucleophile

Polar aprotic solvents, solvation of cations, effect on nucleophilicity