

LEC ①

CHEM 30A

Jan 7th ①

- ① WHO/WHEN/WHERE/HOW?
- ② WHAT?

HMW: READ CH1 sections 1-1.4  
PROBLEMS 1.1-1.5, 1.19-1.22

① Me

- Office 3077D Young Hall

- cantrill@chem.ucla.edu

WEBSITE -

[www.chem.ucla.edu/~cantrill/teaching.htm](http://www.chem.ucla.edu/~cantrill/teaching.htm)



- Lecture notes

- Announcements

- Handouts

- Blank Exams + Keys

PREVIOUS QUARTER STUFF

- Questions OK in class

⇒

ENCOURAGE  
YOU TO COME  
TO CLASS

- ENGLISH ENGLISH

26<sup>th</sup> LETTER, 13<sup>th</sup> ELEMENT, FOOTBALL

MODEL KITS - May be useful

(2)

## TAs

Mike and Rob

Discussion Sections begin MONDAY next week  
↳ times/locations on WEBSITE

All office hours in Young Hall 3077F  
- begin on MONDAY  
↳ times/locations on WEBSITE

## TEXTBOOK

Brown & Foote 3rd Edition  
- HMK/Reading assignments

## EXAMS

Times/locations in SYLLABUS

3	QUIZZES	100	(3 x 35)
2	MIDTERMS	200	(2 x 115)
1	FINAL	<u>200</u>	(1 x 230)
		500	

Final is COMPREHENSIVE

rules: see syllabus

→ Pencil = NO REGRADE etc.

### CHEATING

Don't even think about it...

### SYLLABUS

Tentative, and READ IT.

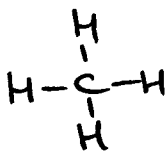
IMPACTED  
CLASS

## ② WHAT? - ORGANIC CHEMISTRY

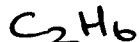
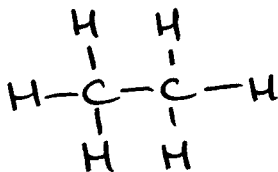
ORGANIC ⇒ CHEMISTRY OF COMPOUNDS  
FROM LIVING THINGS, AS OPPOSED TO  
INORGANIC COMPOUNDS.

→ STUDY OF COMPOUNDS CONTAINING CARBON

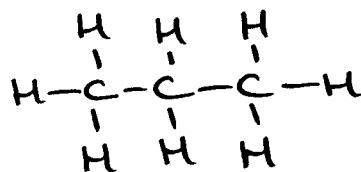
SIMPLEST COMPOUNDS CONTAIN CARBON  
AND HYDROGEN ONLY ⇒ HYDROCARBONS



methane



ethane



propane

ALKANES

Hydrocarbons serve as a framework from which to dangle functional groups

## FUNCTIONAL GROUPS

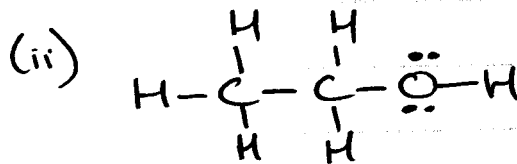
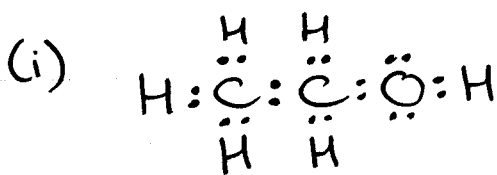
Specific combinations of atoms in precise arrangements -

- (i) DIVIDE ORGANIC COMPOUNDS INTO CLASSES
- (ii) BASIS FOR NAMING
- (iii) PREDICTABLE CHARACTERISTIC REACTIVITY

for example

ALCOHOLS eg.  $\text{CH}_3\text{CH}_2\text{OH}$  ethanol

## DRAWING MOLECULES

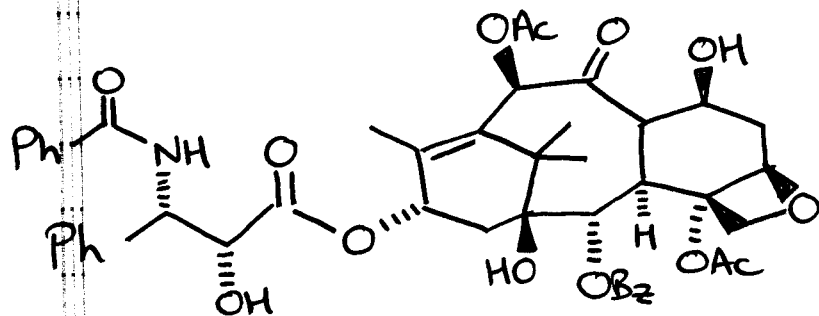


Line formula  
(more on this later)

5

Atoms other than C, H  $\Rightarrow$  HETEROATOMS

e.g. O, N, S, P, F, Cl, Br, I



TAXOL

- FUNCTIONAL GROUPS
- STEREOCHEMISTRY
- COMMON ABBREVIATIONS
- LINE FORMULAE

- most promising anti-tumor agent developed in three decades

1998 SALES \$1.2 BILLION

- Where from - NOT LIKE IT GROWS ON TREES
- Well, yes it does BARK OF PACIFIC YEW

But six 100yr old trees  $\rightarrow$  1 patient  
(kills trees)

6

- SYNTHESIS (making molecules)



REACTIONS ( $A + B \rightarrow C$ )



MECHANISMS (how it all works)



STRUCTURE & BONDING (electrons & orbitals)

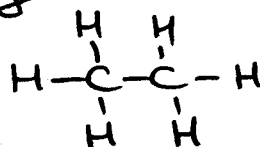
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THINGS YOU NEED TO KNOW

H forms 1 BOND (neutral species)  
C forms 4 BONDS

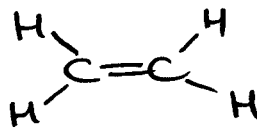
NOT AN ABSOLUTE RULE, BUT WORKS 99% OF TIME

eg.



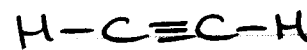
ethane

ALKANE



ethylene

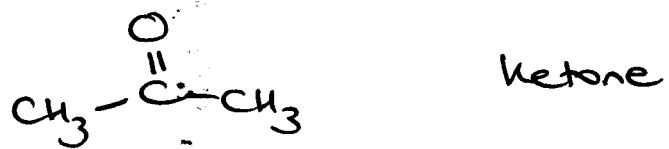
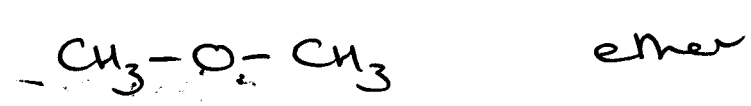
ALKENE



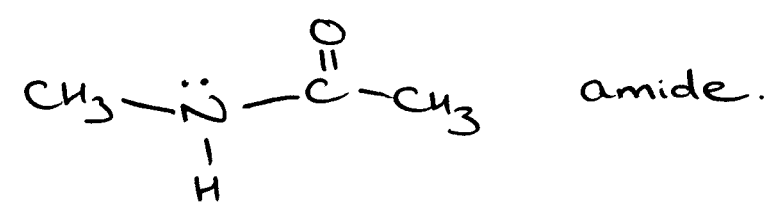
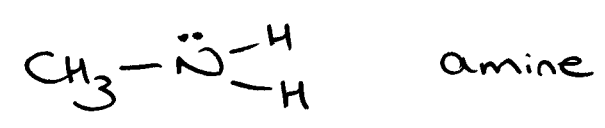
acetylene

ALKYNE

- O forms 2 BONDS  
 - Hal forms 1 BOND  
 (F, Cl, Br, I)



- N forms 3 BONDS



- S, P  $\Rightarrow$  variable # of bonds.