

LEC (5)

CHEM 30A

Apr 13th

①

ALKANES

- ① STRUCTURE
- ② ISOMERS
- ③ NOMENCLATURE

Read Problems 2.1, 2.2 2.17-2.21 (3rd)
2-2.6 2.16-2.25 (4th)

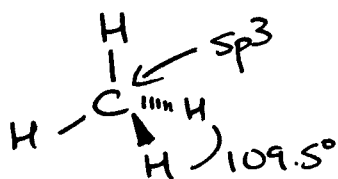
① STRUCTURE

Alkanes → saturated HYDROCARBONS

⇓
each C has
max # Hs

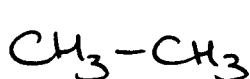
⇓
only C & H

General formula C_nH_{2n+2} (no rings)

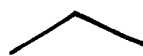


METHANE

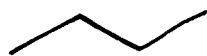
CH_4



ETHANE C_2H_6



PROPANE C_3H_8



BUTANE C_4H_{10}



PENTANE C_5H_{12}

and so on....

hex, hept, oct,
non, dec...

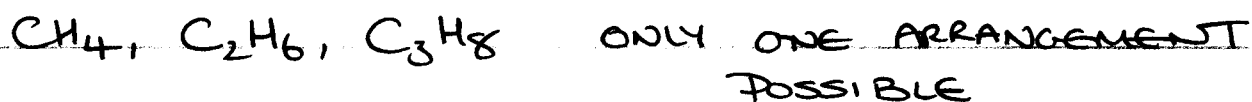
(2)



(2) ISOMERS

- same molecular formula, different arrangement of atoms

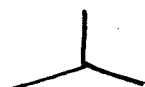
⇒ CONSTITUTIONAL ISOMERS



How about C_4H_{10}



butane



2 methylpropane

Do C_6H_{14}
for HMK

(5 structures)

(3) NOMENCLATURE

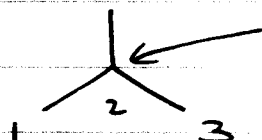
International Union of Pure and Applied Chemistry
IUPAC ⇒ SYSTEMATIC NAMING

- Straight chains (done)

- BRANCHED STRUCTURES

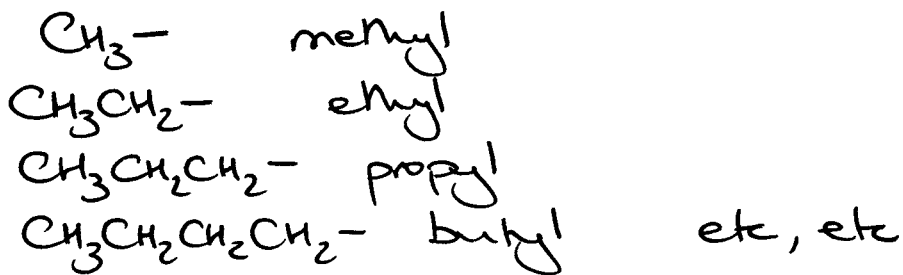
(i) Identify longest chain

(ii) Each substituent gets a name & number

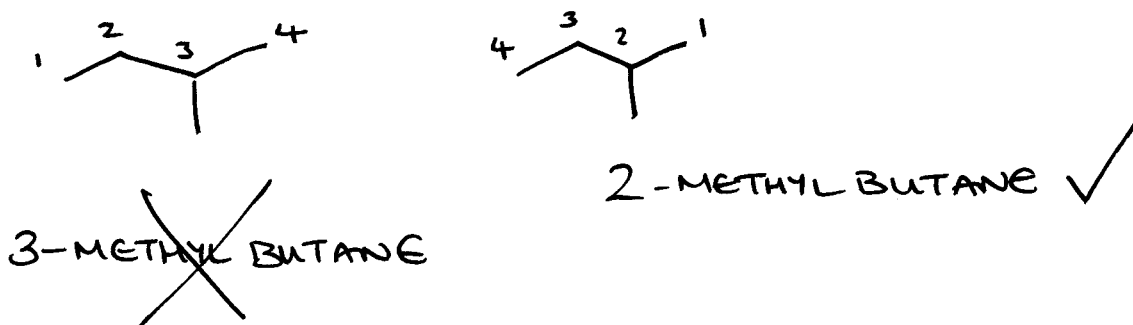


2 METHYL PROPANE

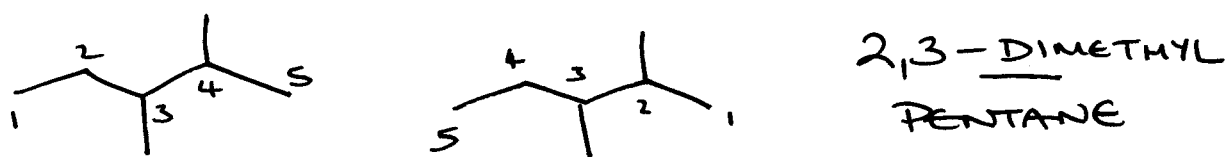
ALKYL GROUPS



(iii) MINIMISE SUBSTITUENT NUMBER

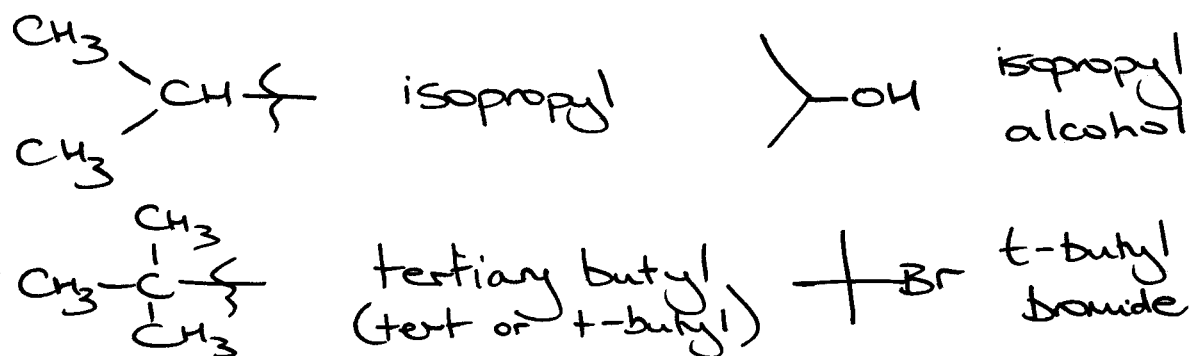


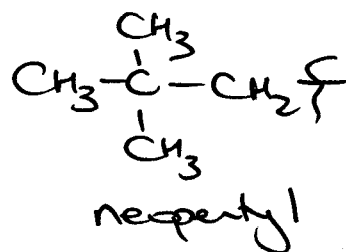
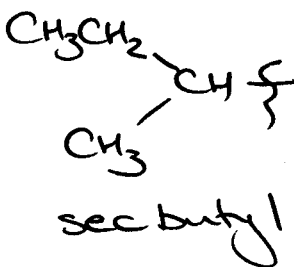
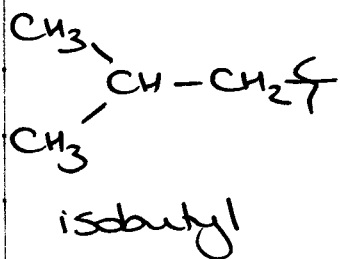
(iv) SAME SUBSTITUENT MORE THAN ONCE



- after this, it gets SILLY!

COMMON NAMES





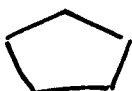
CYCLOALKANES (C_nH_{2n})



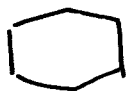
CYCLOPROPANE C₃H₆



CYCLOBUTANE C₄H₈



CYCLOPENTANE C₅H₁₀



CYCLOHEXANE C₆H₁₂

BICYCLOALKANES - FORGET IT!

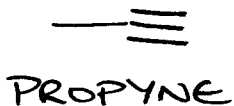
General rules: PREFIX - INFIX - SUFFIX



PROP	AN	E
3Cs	Single Bonds	Hydrocarbon



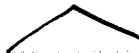
-EN-
Double



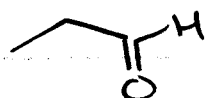
-YN-
Triple

5

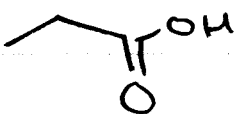
SUFFIXES - functional groups


-E  PROPANE

-OL  PROPANOL

-AL  PROPANAL

-ONE  PROPANONE

-OIC ACID  PROPANOIC ACID

(-AMINE)*  PROPYL AMINE
NOT PROPANAMINE!

- COMMON NAMES