

Licence Sciences Pour la Santé



UE Bases en Sciences de la vie

PARTIE CHIMIE (JEAN-MARC LANCELIN)

TD 2/2 DU LUNDI 18 OCTOBRE 2021

Travaux dirigés séance 2

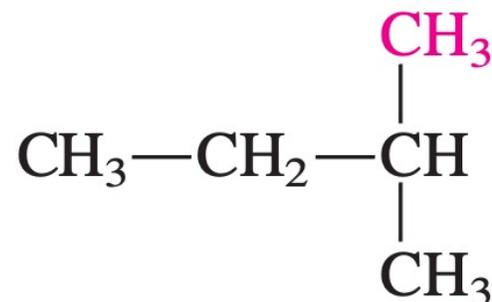
- Molécules, fonctions chimiques, isomérisme.

Structure moléculaire et fonctions organiques

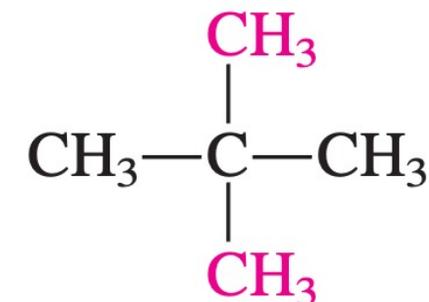
The Isomeric Pentanes



Pentane



2-Methylbutane
(Isopentane)



2,2-Dimethylpropane
(Neopentane)

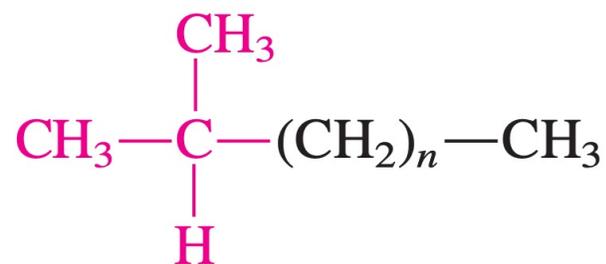
Structure moléculaire et fonctions organiques

Table 2-4		Number of Possible Isomeric Alkanes, C_nH_{2n+2}
<i>n</i>	Isomers	
1	1	1
2	1	1
3	1	1
4	2	2
5	3	3
6	5	5
7	9	9
8	18	18
9	35	35
10	75	75
15	4,347	4,347
20	366,319	366,319

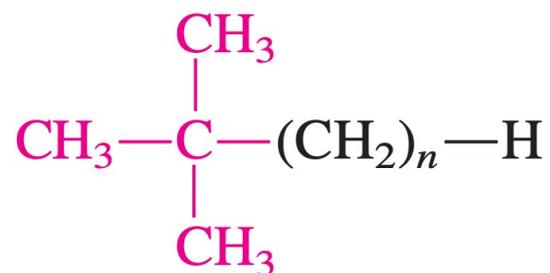
Exercise 2-16

(a) Draw the structures of the five isomeric hexanes. (b) Draw the structures of all the possible next higher and lower homologs of 2-methylbutane.

Structure moléculaire et fonctions organiques



An isoalkane
(e.g., $n = 1$, isopentane)



A neoalkane
(e.g., $n = 2$, neohexane)

Alkyl groups



Methyl



Ethyl



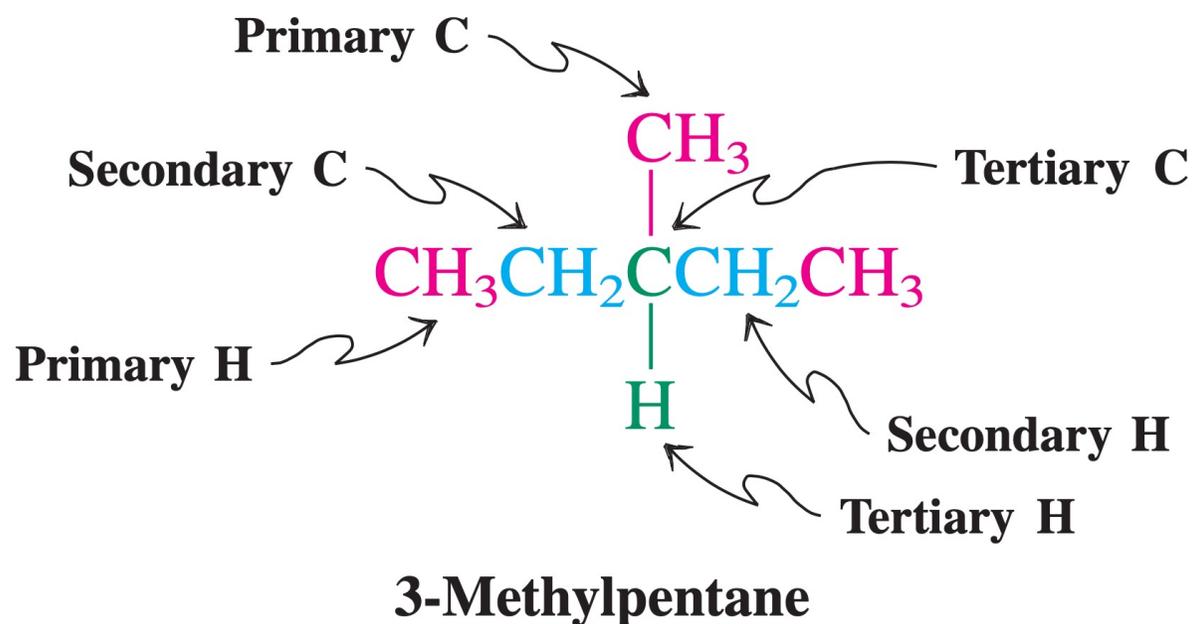
Propyl

Exercise 2-17

Draw the structures of isohexane and neopentane.

Structure moléculaire et fonctions organiques

Primary, Secondary, and Tertiary Carbons and Hydrogens

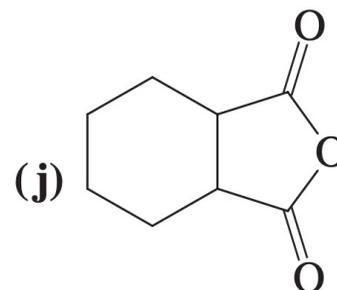
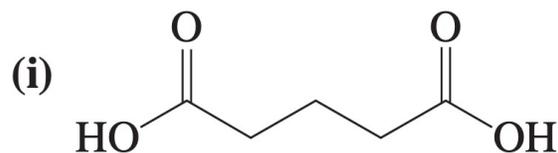
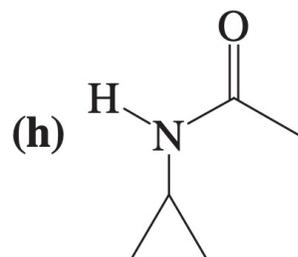
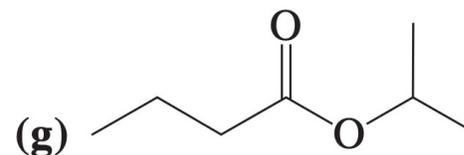
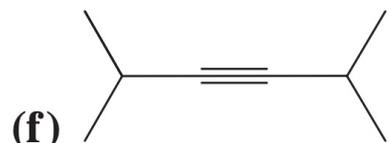
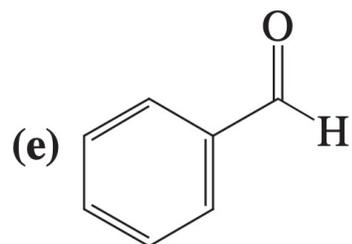
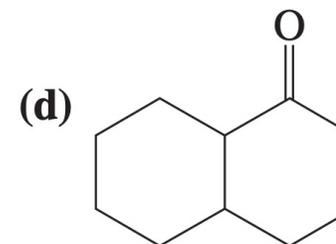
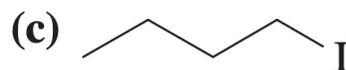
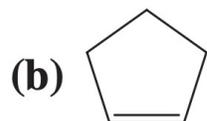
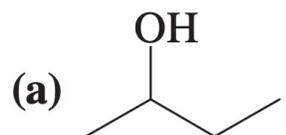


Exercise 2-18

Label the primary, secondary, and tertiary hydrogens in 2-methylpentane (isohexane).

Structure moléculaire et fonctions organiques

32. Circle and identify by name each functional group in the compounds pictured.



Structure moléculaire et fonctions organiques

- A partir d'une formule brute qu'on eut obtenir expérimentalement par des analyses chimiques (dont la spectrométrie de masse) on peut déduire le « degré d'insaturation » (= nombre de liaisons π et/ou cycles)

$$N_i = \frac{2 \times N_C + 2 - N_H + N_N - N_X}{2}$$

N_i : nombre d'insaturation

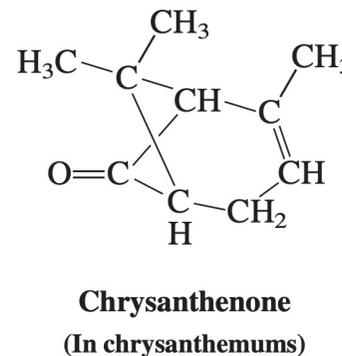
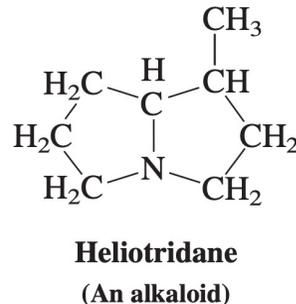
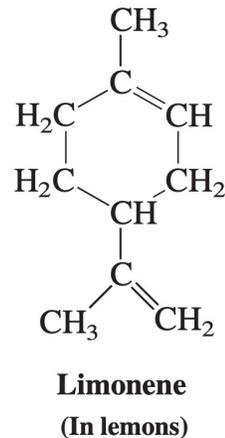
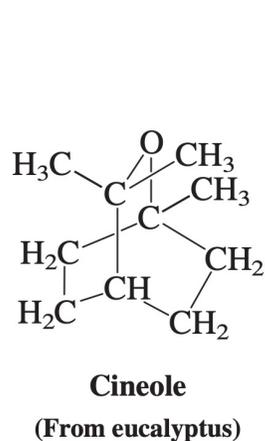
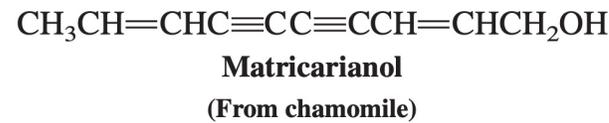
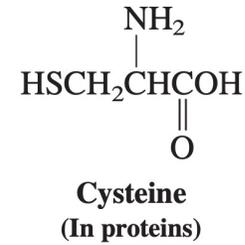
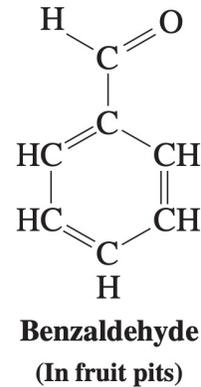
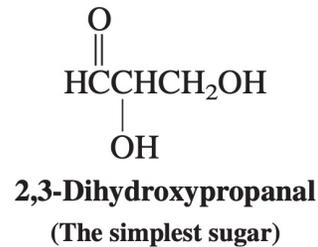
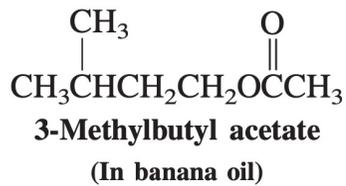
N_C : nombre de carbones

N_H : nombre d'hydrogènes

N_N : nombre d'azotes

N_X : nombre d'halogènes ($X = F, Cl, Br, I$)

Calculer le \mathcal{N}_i d'après les formules suivantes et justifier



Différents isomérismes

- Définir les différents types d'isomérisme des molécules

Exercices TD, pour aller plus loin



Côté, I.; Lebrun, L.; Sard, N. *Physique-Chimie BCPST 1 - Exercices incontournables*; 2018.

Page UTC de Véronique Pelassa

<http://www.utc.fr/~vpelassa/>

en particulier la partie « CM80 » avec le TD et les corrigés.

Autres exercices corrigés :

https://bbiblio.weebly.com/uploads/2/1/0/9/21090690/les_acides_et_les_bases_corrige_des_exercices.pdf