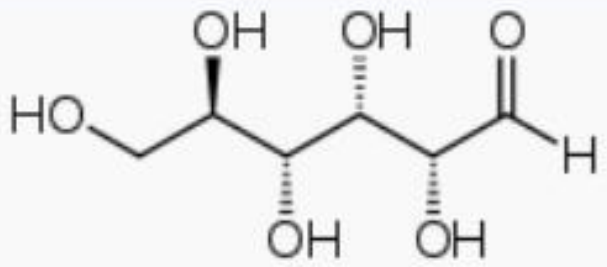
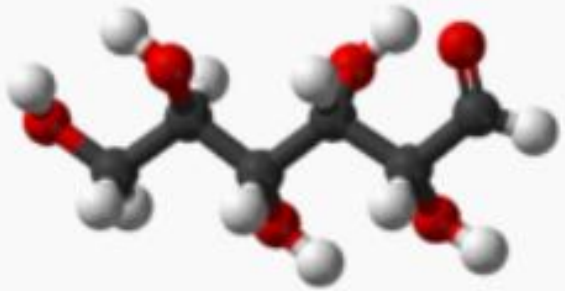
Molécules complexes

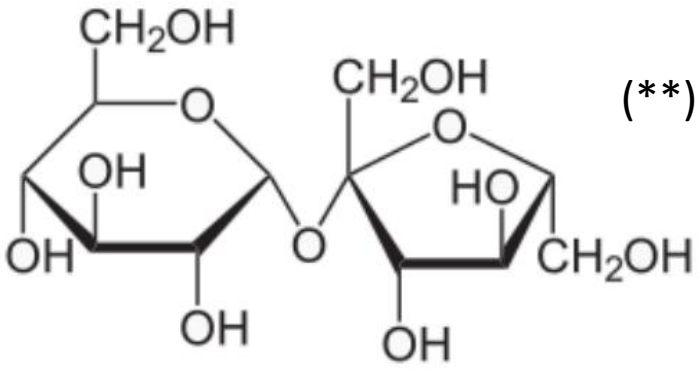
D-Glucose



Open chain form of D-glucose



Sucrose



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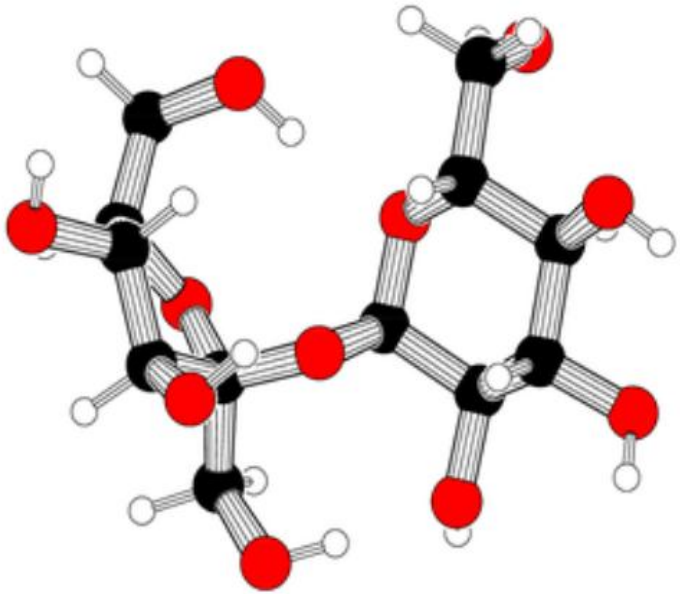
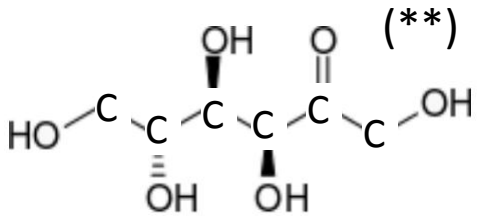


Fructose



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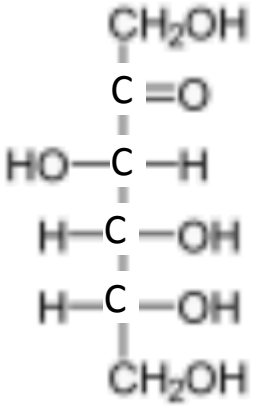
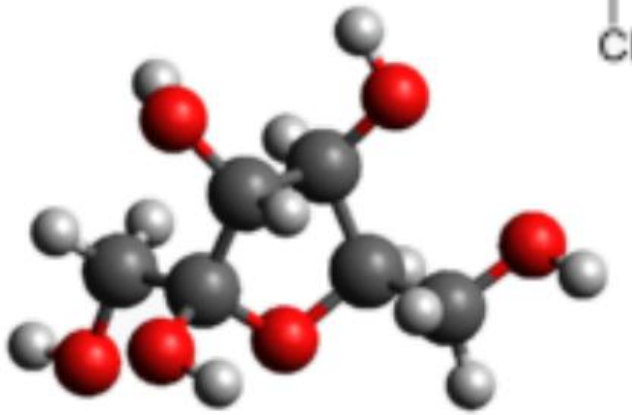
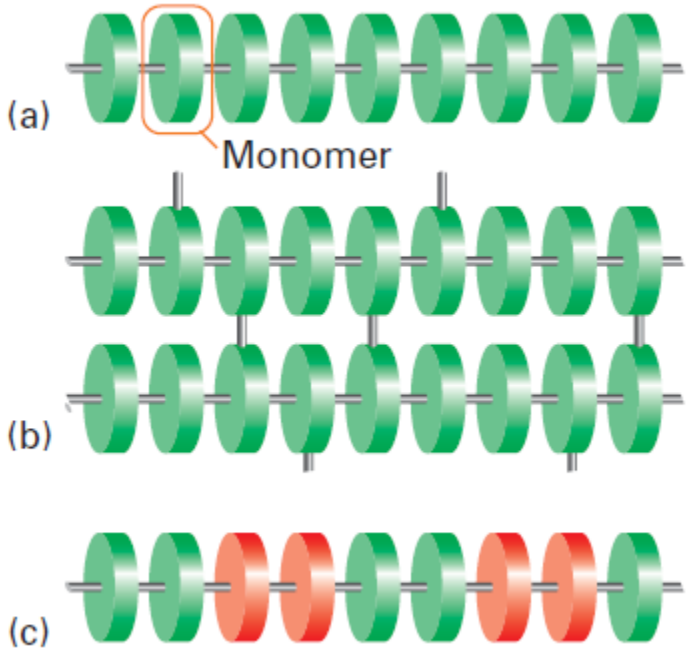




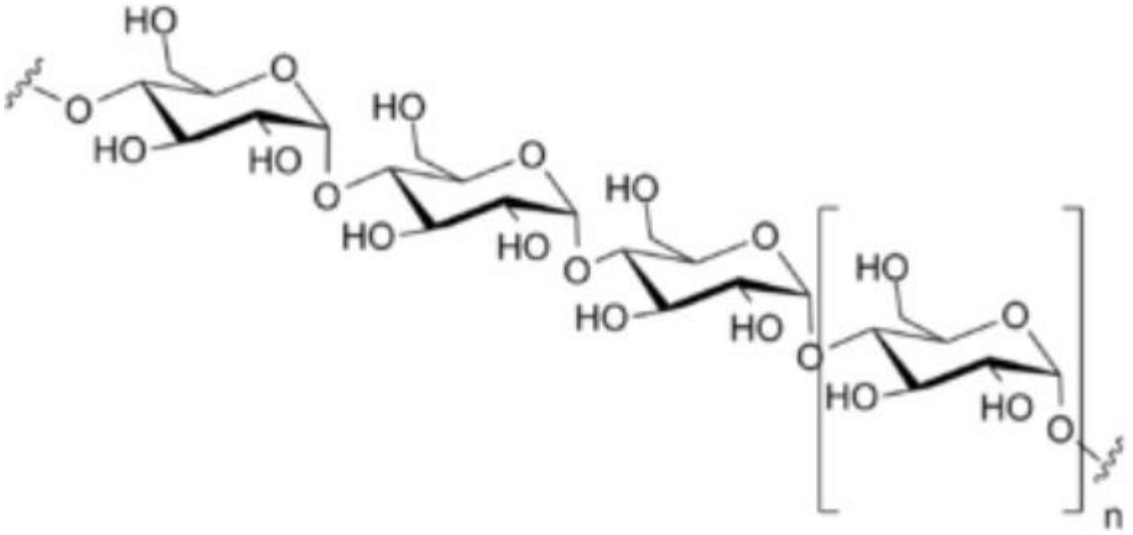
**Manque certains atomes d'hydrogène

Macromolécules



	Macromolecule	Unités (résidus)
Naturel		
1	peptide	acide aminés
	polypeptide	peptides
	protein	polypeptides
2	poly nucléotides	nucléotides
	acide désoxyribonucléique (ADN)	
3	polysaccharide	saccharide
Synthétique		
4	Polymère	monomère

Macromolécules : Polysaccharide



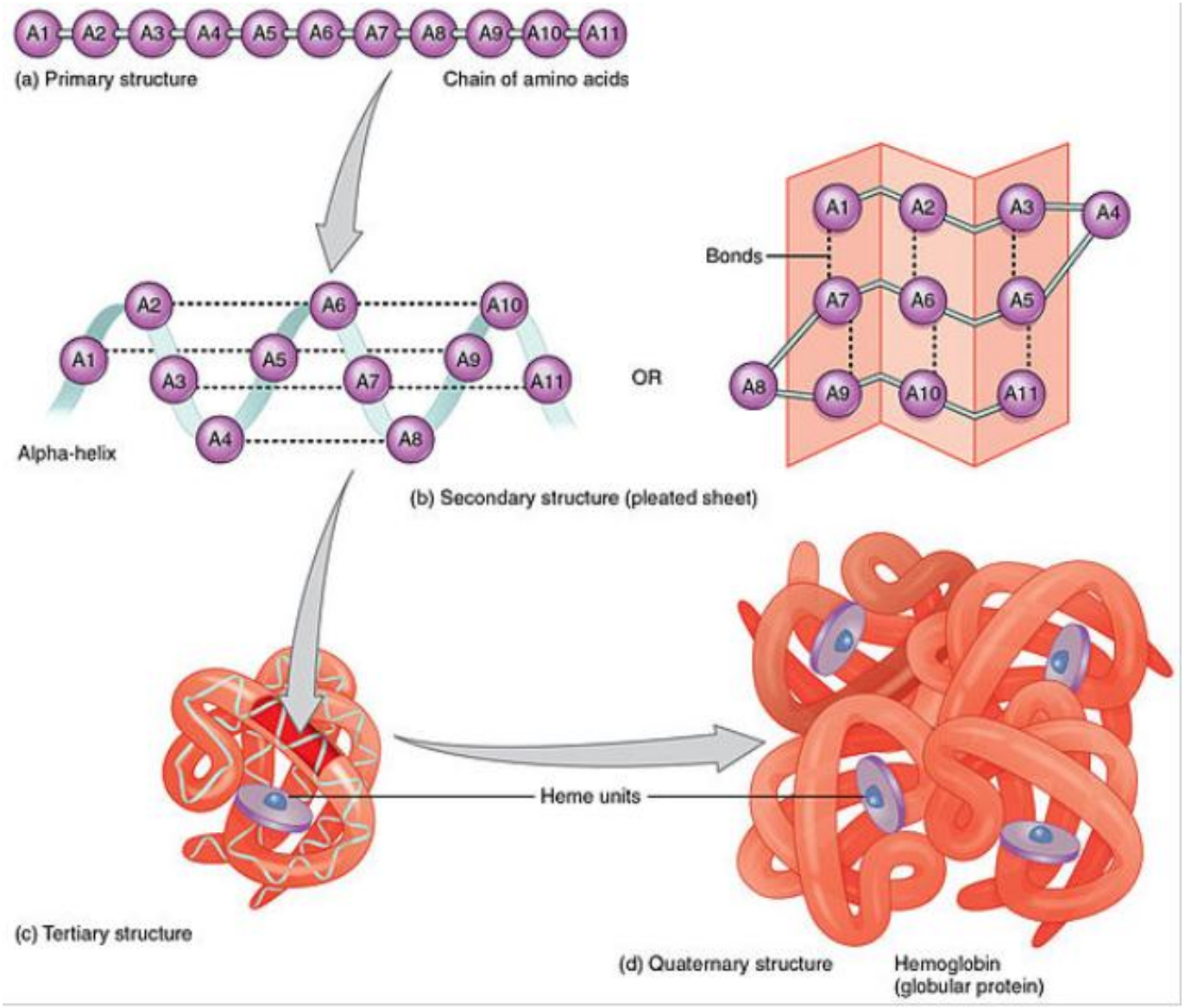
Amylose = poly(glucose)

Macromolécules : proteins

Primaire

Secondaire

Tertiaire



Twenty-One Amino Acids

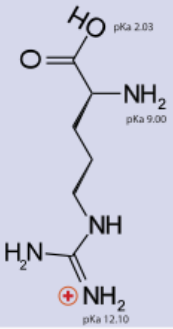
⊕ Positive ⊖ Negative

• Side chain charge at physiological pH 7.4

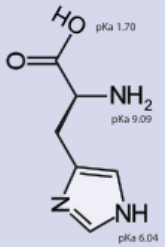
A. *Amino Acids with Electrically Charged Side Chains*

Positive

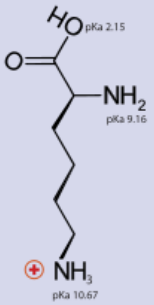
Arginine (Arg) R



Histidine (His) H

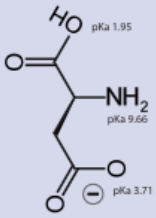


Lysine (Lys) K

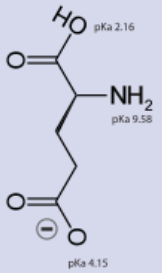


Negative

Aspartic Acid (Asp) D

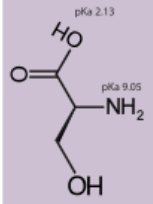


Glutamic Acid (Glu) E

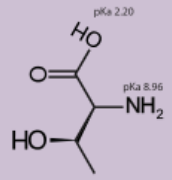


B. *Amino Acids with Polar Uncharged Side Chains*

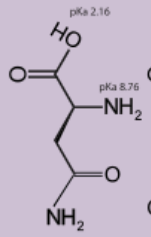
Serine (Ser) S



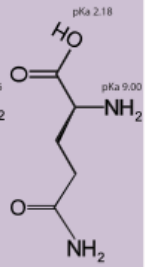
Threonine (Thr) T



Asparagine (Asn) N

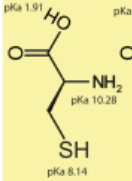


Glutamine (Gln) Q

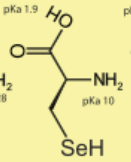


C. *Special Cases*

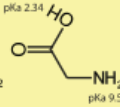
Cysteine (Cys) C



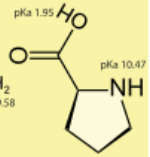
Selenocysteine (Sec) U



Glycine (Gly) G

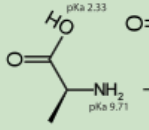


Proline (Pro) P

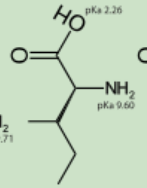


D. *Amino Acids with Hydrophobic Side Chain*

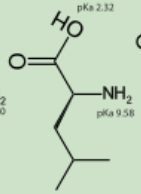
Alanine (Ala) A



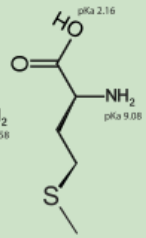
Isoleucine (Ile) I



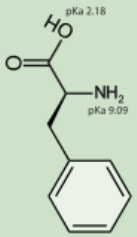
Leucine (Leu) L



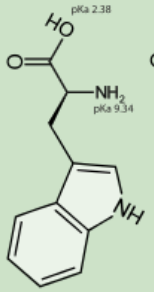
Methionine (Met) M



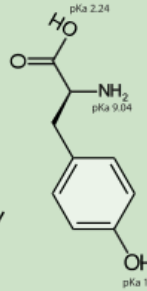
Phenylalanine (Phe) F



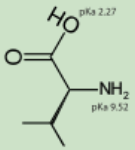
Tryptophan (Trp) W



Tyrosine (Tyr) Y



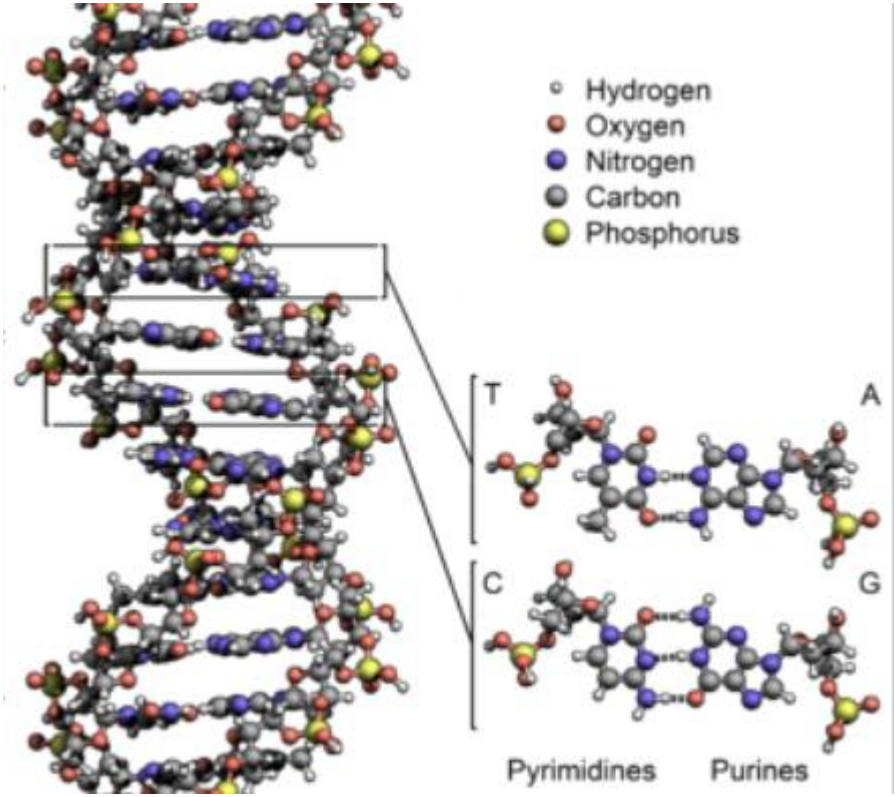
Valine (Val) V

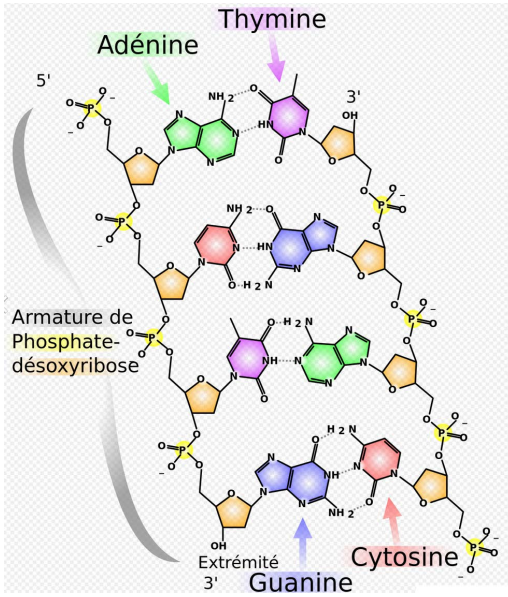


pKa Data: CRC Handbook of Chemistry, v.2010

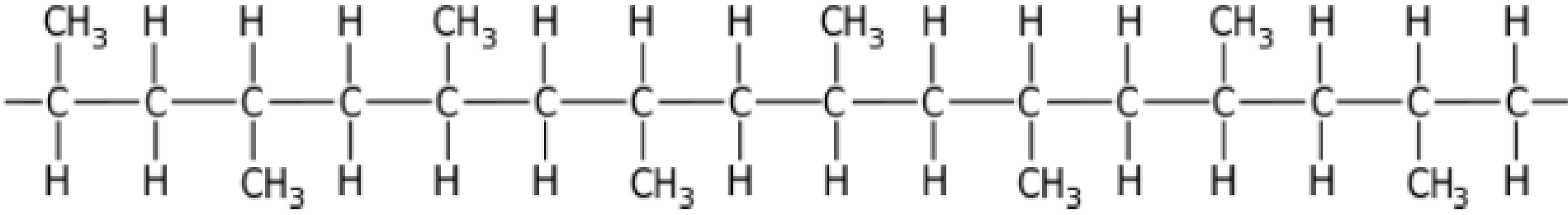
Amino Acid	pI	pK_1 (α-COOH)	pK_2 (α-$^+NH_3$)
Alanine	6.01	2.35	9.87
Cysteine	5.05	1.92	10.70
Aspartic acid	2.85	1.99	9.90
Glutamic acid	3.15	2.10	9.47
Phenylalanine	5.49	2.20	9.31
Glycine	6.06	2.35	9.78
Histidine	7.60	1.80	9.33
Isoleucine	6.05	2.32	9.76
Lysine	9.60	2.16	9.06
Leucine	6.01	2.33	9.74
Methionine	5.74	2.13	9.28
Asparagine	5.41	2.14	8.72
Proline	6.30	1.95	10.64
Glutamine	5.65	2.17	9.13
Arginine	10.76	1.82	8.99
Serine	5.68	2.19	9.21
Threonine	5.60	2.09	9.10
Valine	6.00	2.39	9.74
Tryptophan	5.89	2.46	9.41
Tyrosine	5.64	2.20	9.21

Macromolécules : ADN

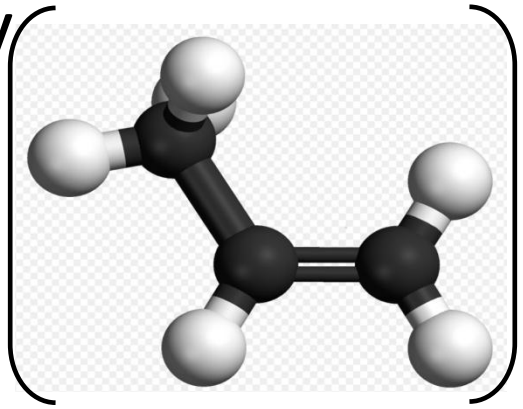


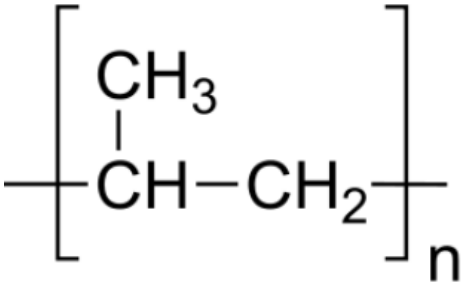


Macromolécules : Polymères



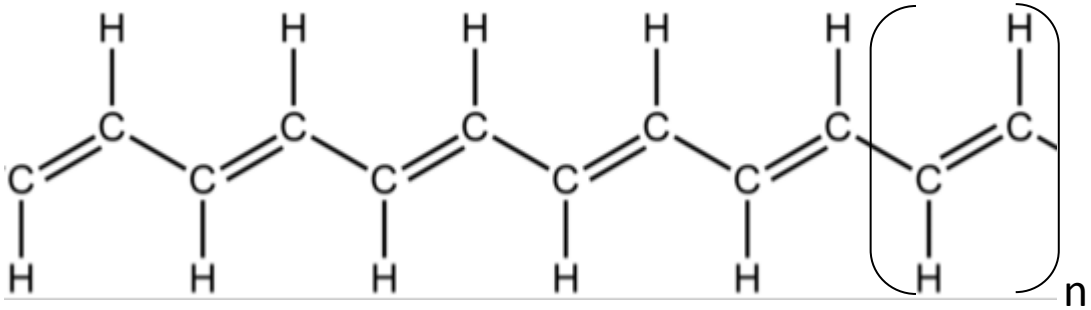
polypropylène = poly

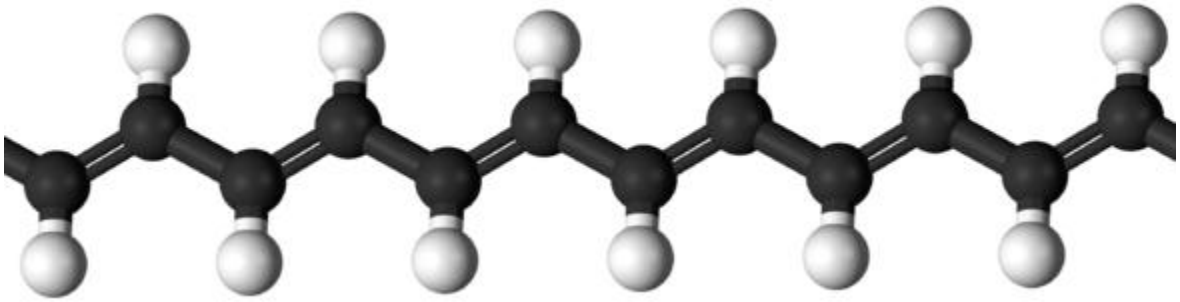


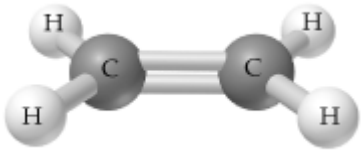


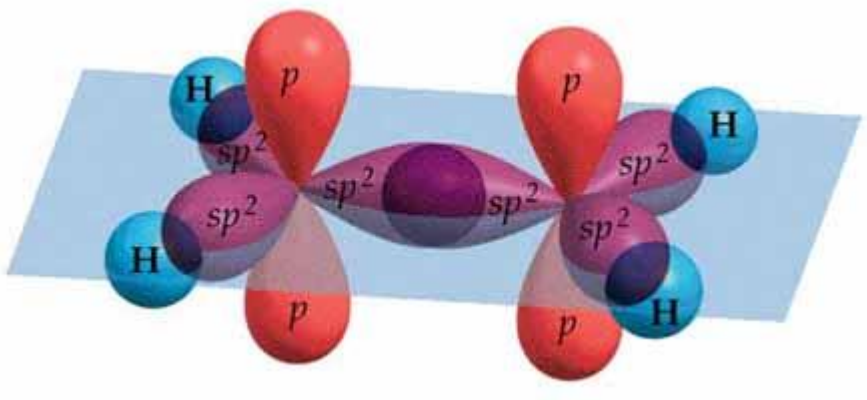
Polyethyne (liaisons délocalisés)

$(C_2H_2)_n$






H
H
C
C
H
H


H
p
sp2
sp2
sp2
sp2
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p
H
H
p
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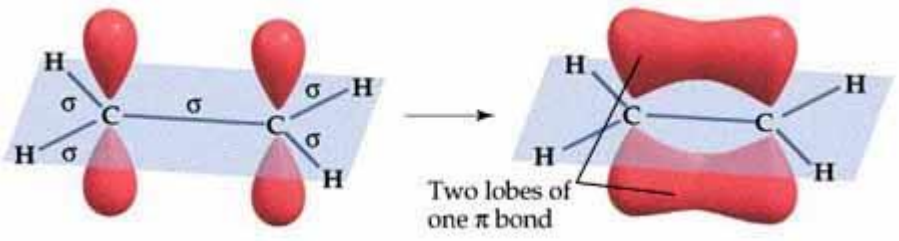
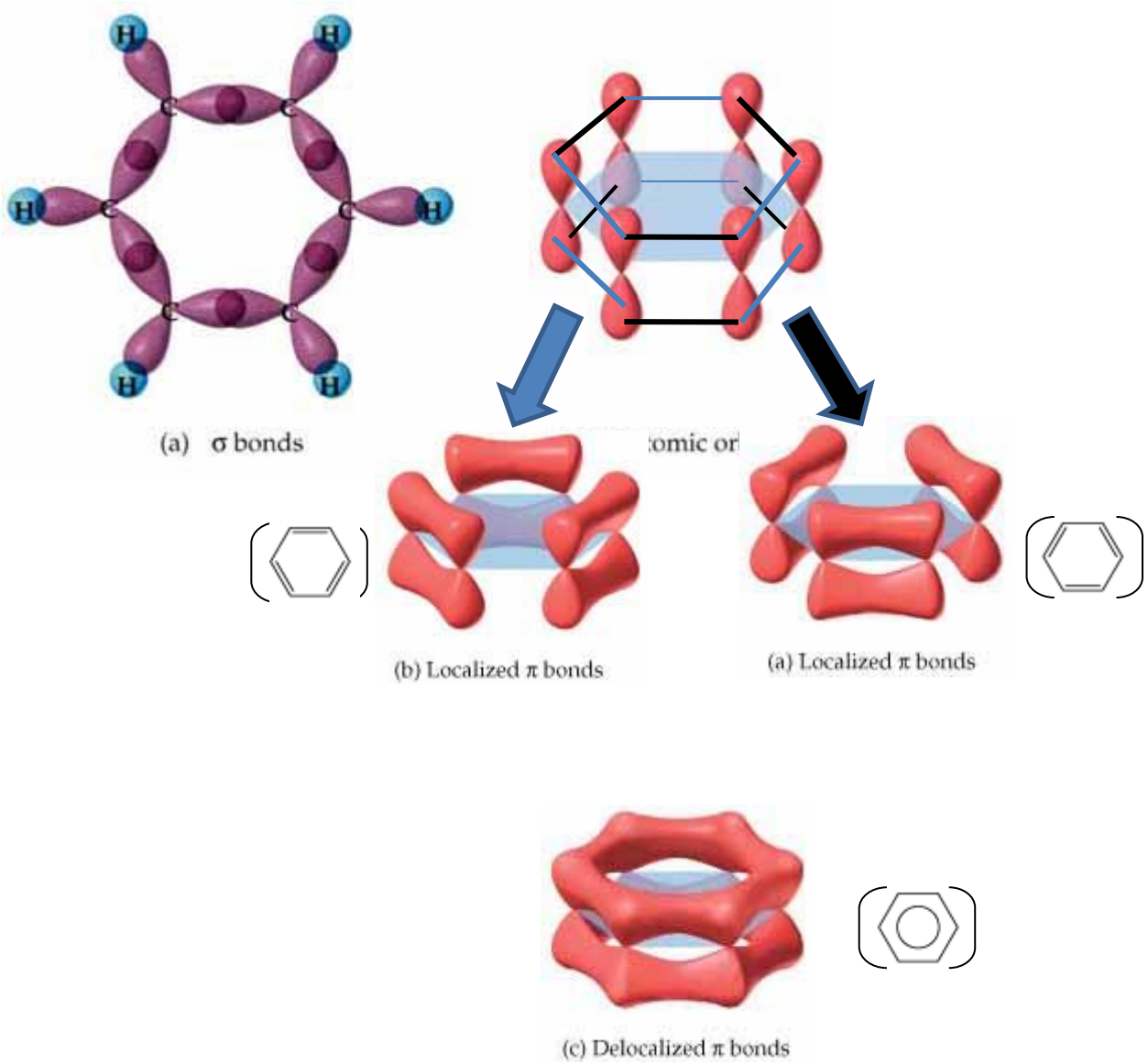
H


H
σ
C
σ
C
σ
H
H
σ
σ
H
H
C
C
H
H
H
H
Two lobes of
one π bond

Benzène


(a) σ bonds
(b) Localized π bonds
(a) Localized π bonds
(c) Delocalized π bonds