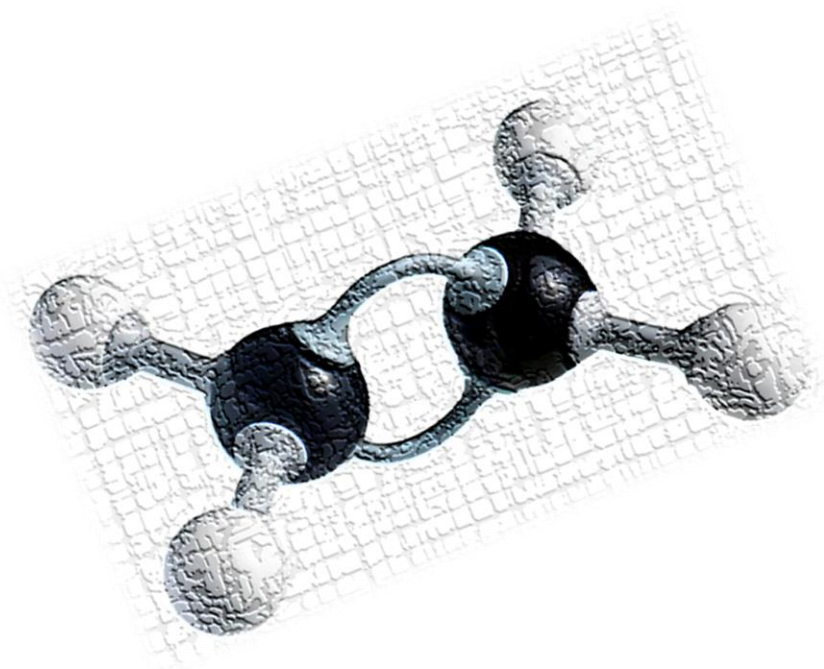


[*HIDROCARBUROS ALIFÁTICOS - 2*]
ALQUENOS

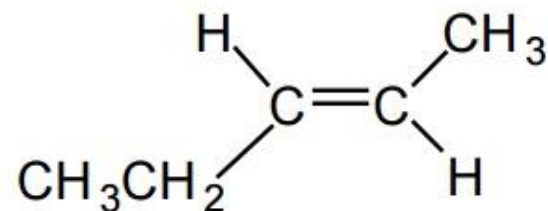
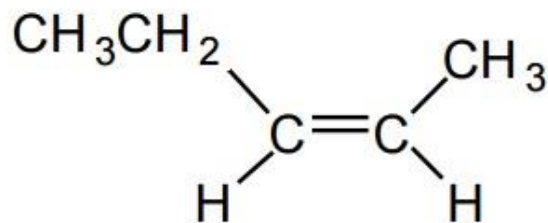
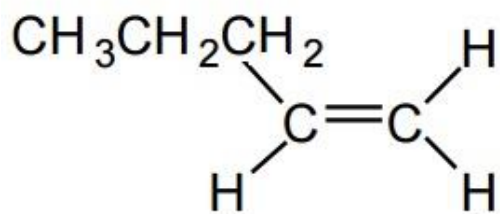
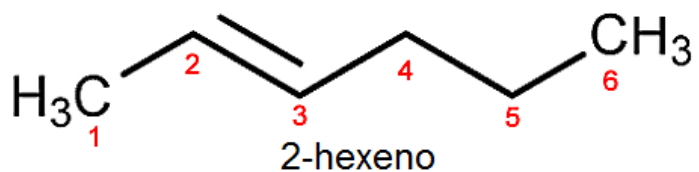
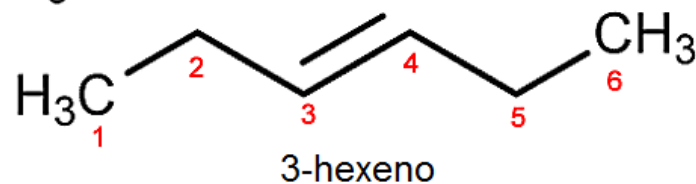
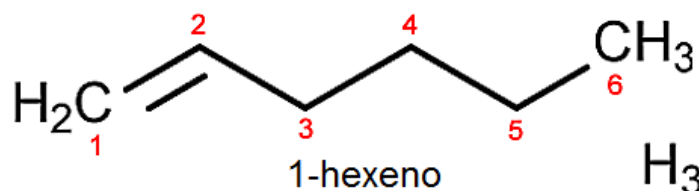


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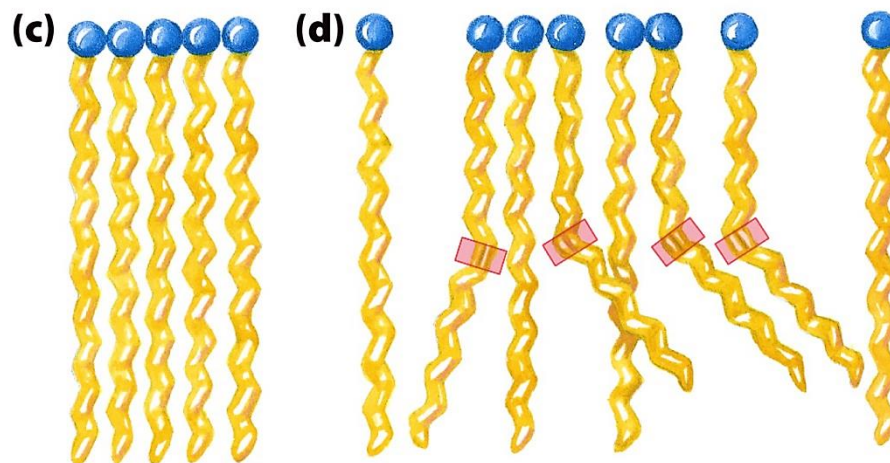
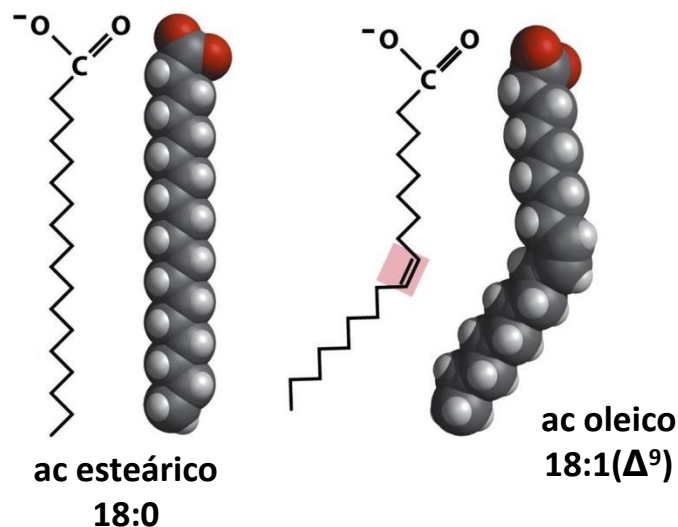
Molecular formula	Full structural formula
C_2H_4 Eteno	<pre> H H C = C H H </pre>
C_3H_6 Propeno	<pre> H H H H - C - C = C H H </pre>
C_4H_8 1-buteno	<pre> H H H H H - C - C - C = C H H H </pre>
C_5H_{10} 1-penteno	<pre> H H H H H H - C - C - C - C = C H H H H </pre>

Molecular formula	Full structural formula
C_6H_{12} 1-hexeno	<pre> H H H H H H H - C - C - C - C - C = C H H H H H </pre>
C_7H_{14} 1-hepteno	<pre> H H H H H H H H - C - C - C - C - C - C = C H H H H H H </pre>
C_8H_{16} 1-octeno	<pre> H H H H H H H H H - C - C - C - C - C - C - C = C H H H H H H H </pre>

Alquenos – isómeros de posición y geométricos

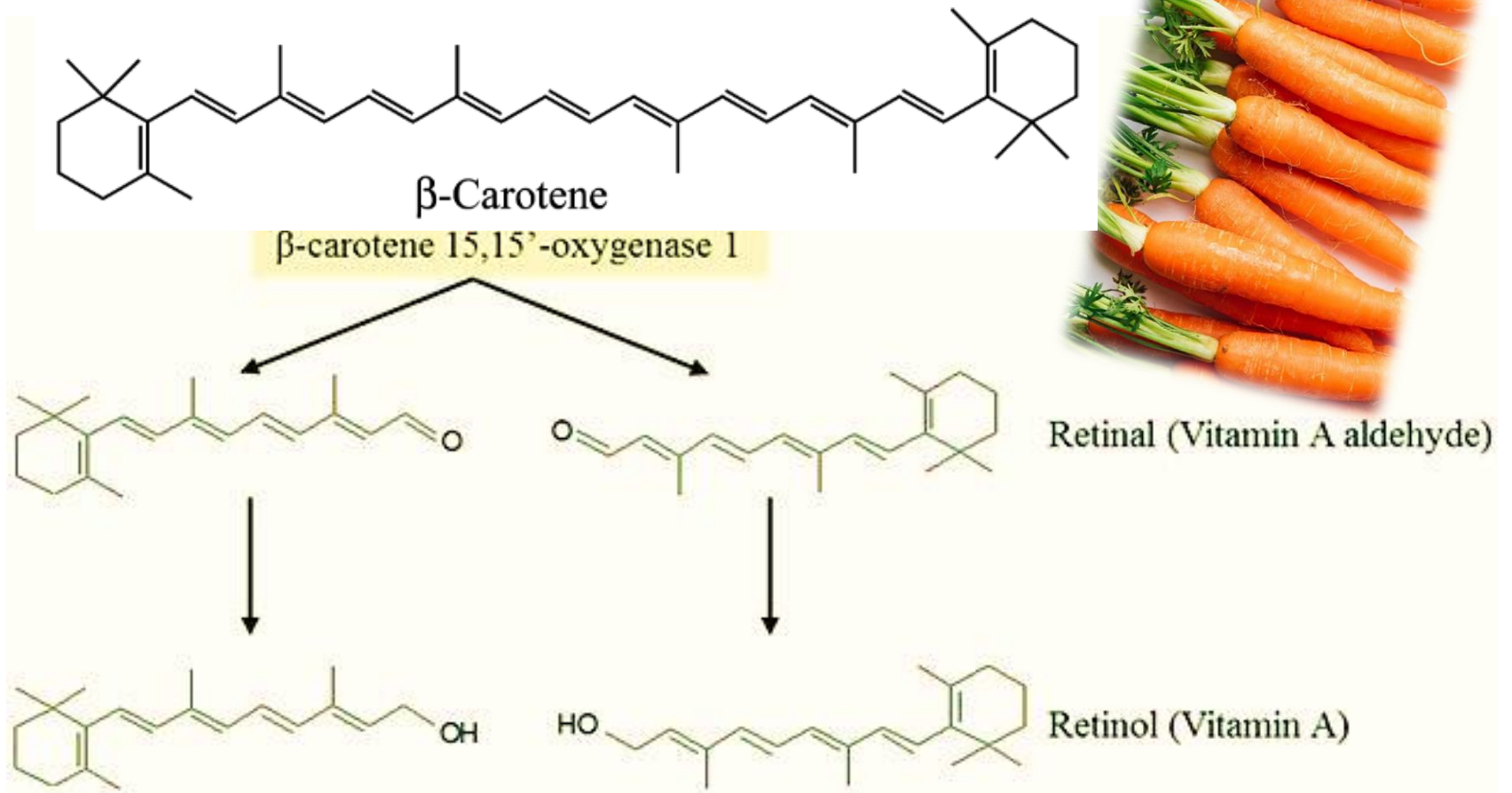


Ácidos grasos – propiedades físicas

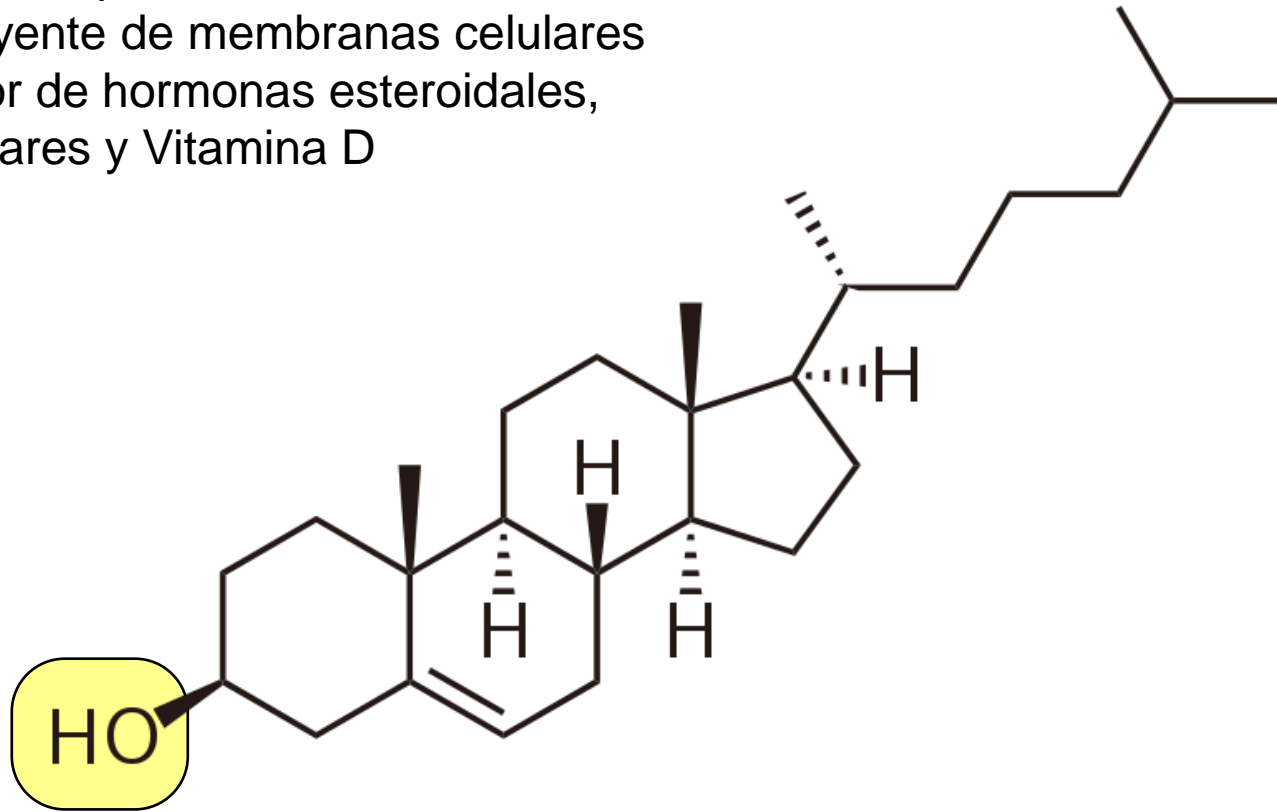


C: (=)	Formula	Nombres	T fusion (°C)	
18:0	$\text{CH}_3(\text{CH}_2)_{16}\text{COOH}$	<i>n</i> -Octadecanoic acid	Stearic acid	69.6
18:1(Δ^9)	$\text{CH}_3(\text{CH}_2)_7\text{CH}=\text{CH}(\text{CH}_2)_7\text{COOH}$	<i>cis</i> -9-Octadecenoic acid	Oleic acid	13.4
18:2($\Delta^{9,12}$)	$\text{CH}_3(\text{CH}_2)_4\text{CH}=\text{CHCH}_2\text{CH}=\text{CH}(\text{CH}_2)_7\text{COOH}$	<i>cis</i> -, <i>cis</i> -9,12-Octadecadienoic acid	Linoleic acid	1–5
18:3($\Delta^{9,12,15}$)	$\text{CH}_3\text{CH}_2\text{CH}=\text{CHCH}_2\text{CH}=\text{CHCH}_2\text{CH}=\text{CH}(\text{CH}_2)_7\text{COOH}$	<i>cis</i> -, <i>cis</i> -, <i>cis</i> -9,12,15-Octadecatrienoic acid	α -Linolenic acid	-11

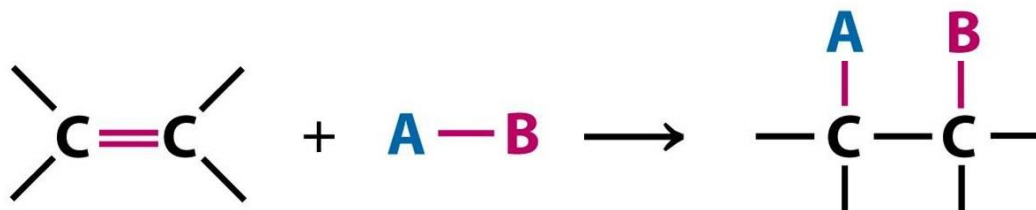
Carotenos – Vitamina A



- ✓ Molécula anfipática
- ✓ Constituyente de membranas celulares
- ✓ Precursor de hormonas esteroidales, sales biliares y Vitamina D



Adición electrofílica al doble enlace



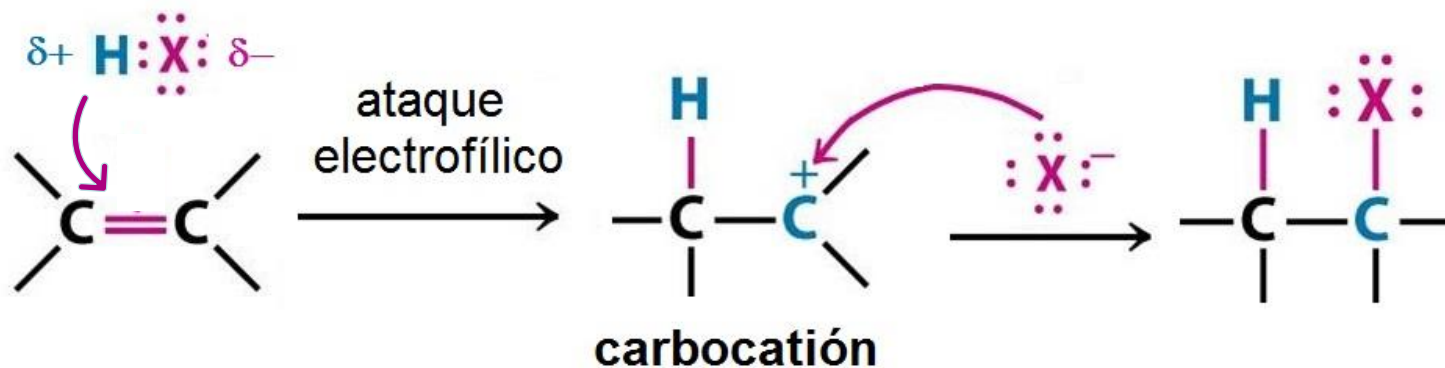
A – B

H₂

HX

X₂

H₂O



Alquenos – Reacciones

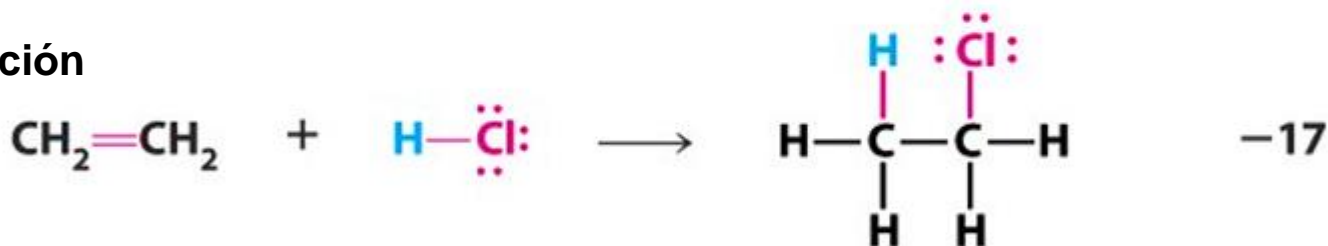
- Hidrogenación



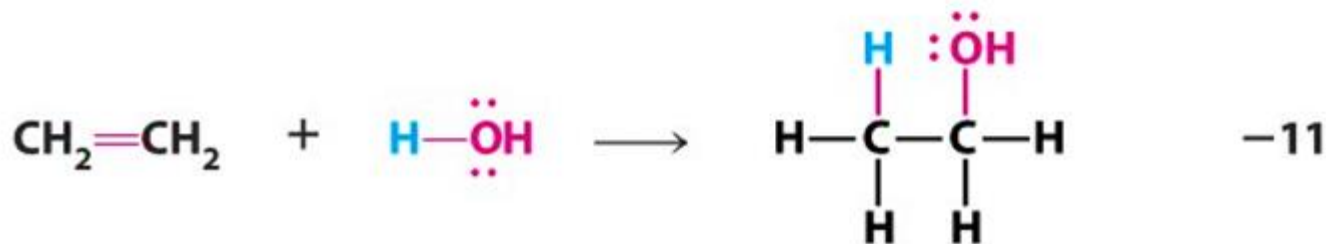
- Halogenación



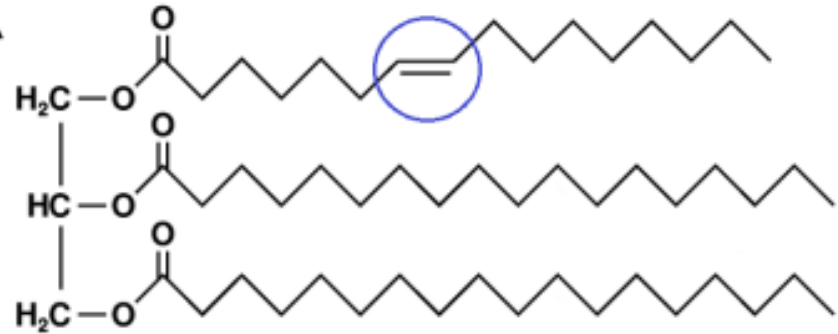
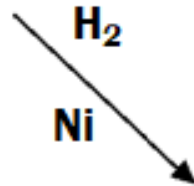
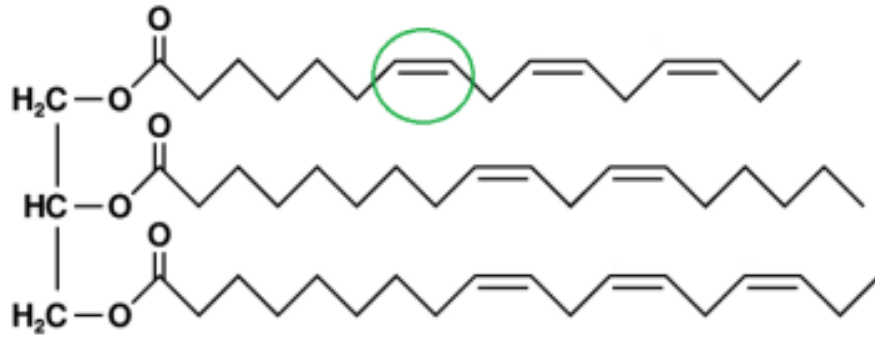
- Hidrohalogenación

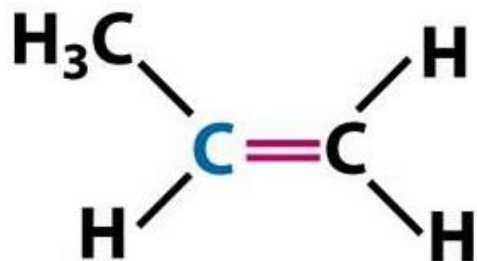


- Hidratación

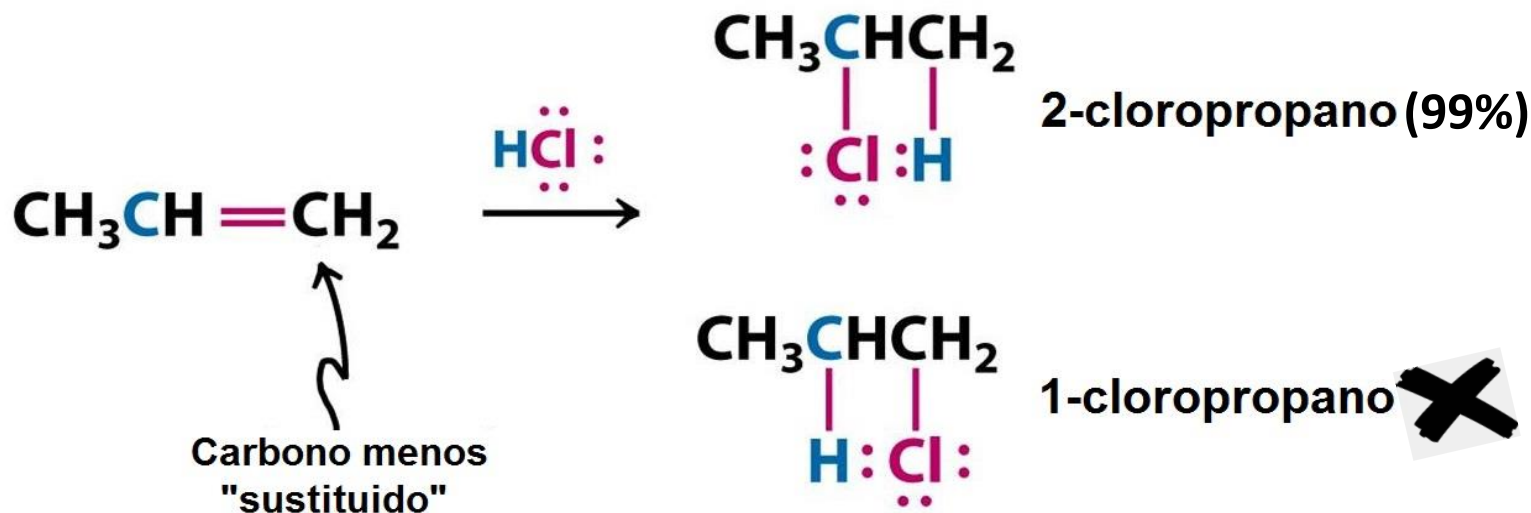


Hidrogenación – Acs grasos

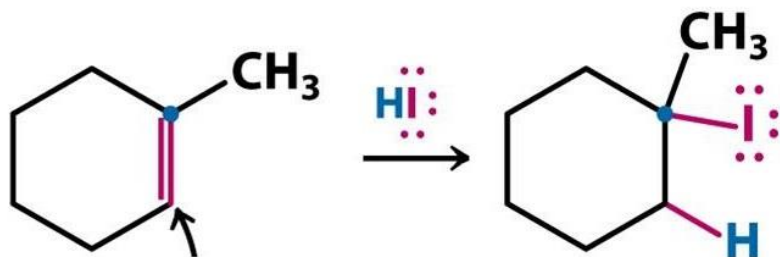
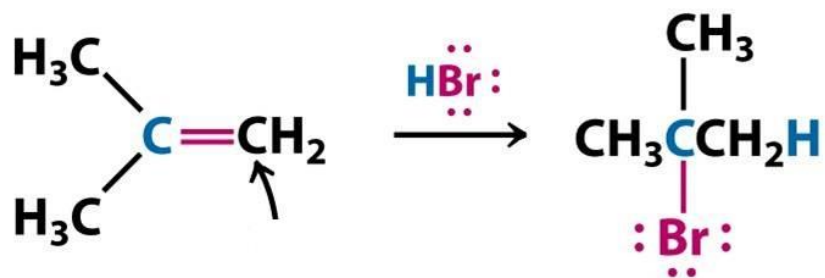




¿Cómo ocurre la adición de un electrófilo asimétrico a un alqueno asimétrico?



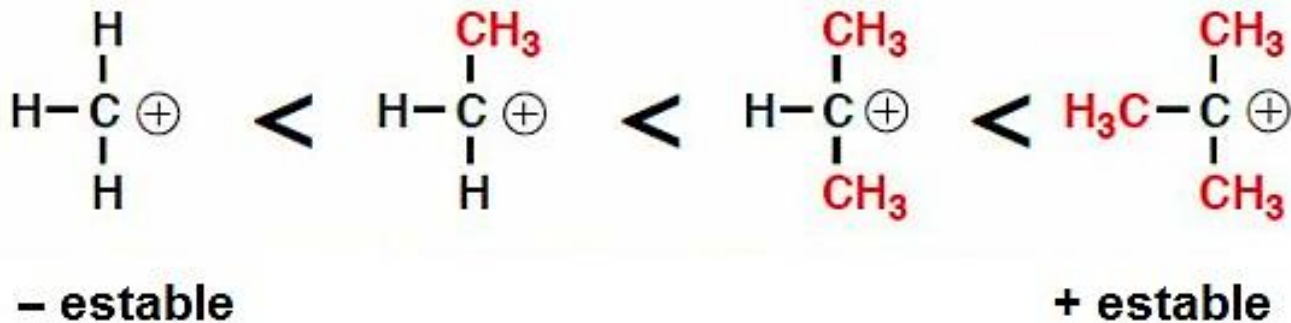
El ataque electrofílico inicial del H^+ , ocurre siempre sobre el carbono menos sustituido (el que está enlazado a más Hs).



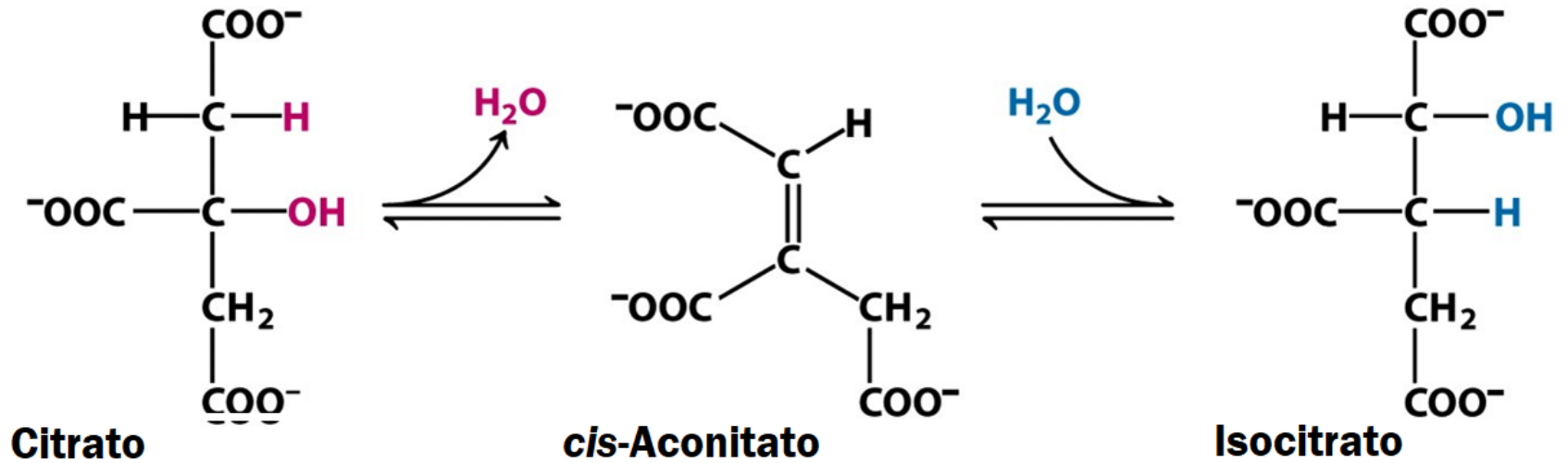
Regla de Markovnikov

Un carbocatión es más estable cuando tiene más carbonos unidos al carbono (+).

Permiten una mejor estabilización de la carga positiva

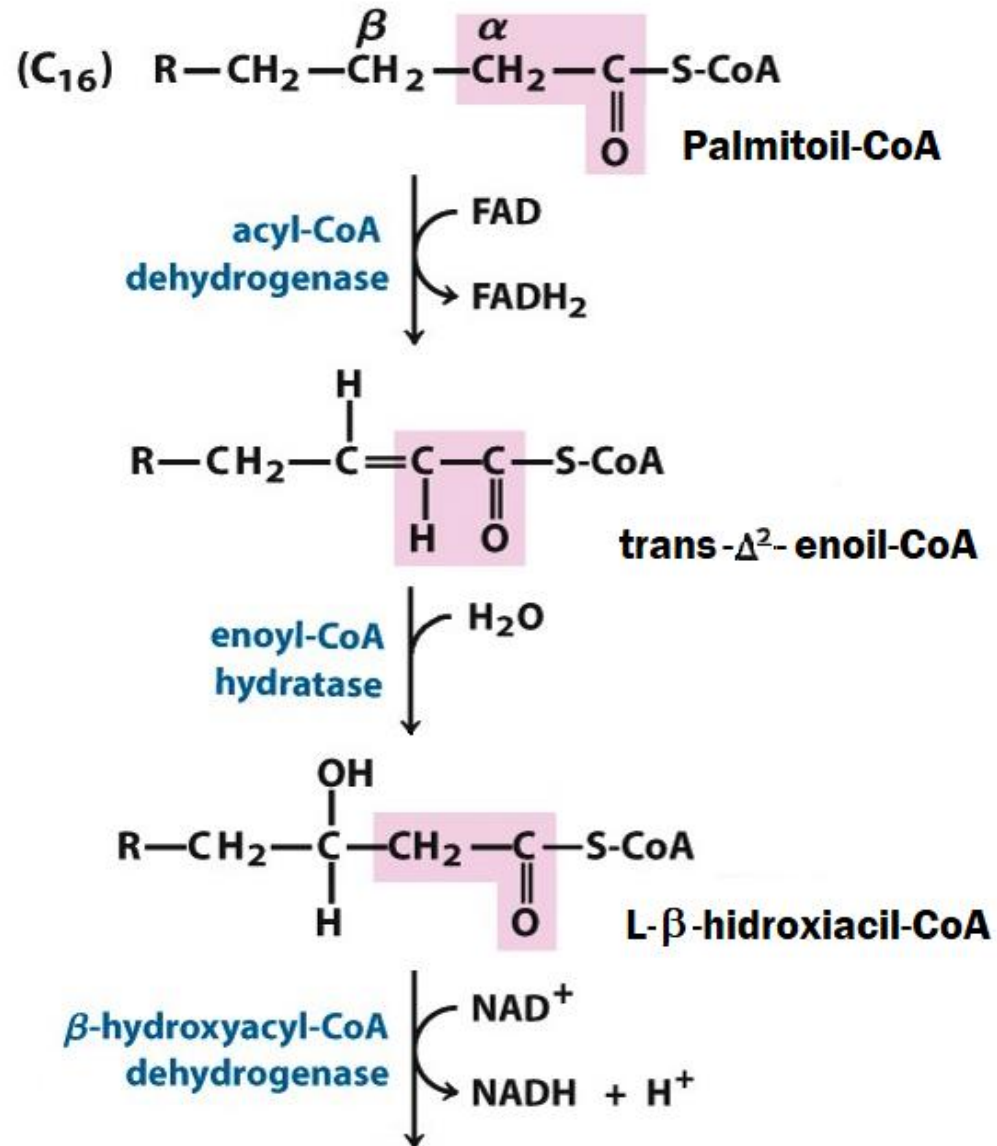


Ciclo de Krebs | *Deshidratación-hidratación*

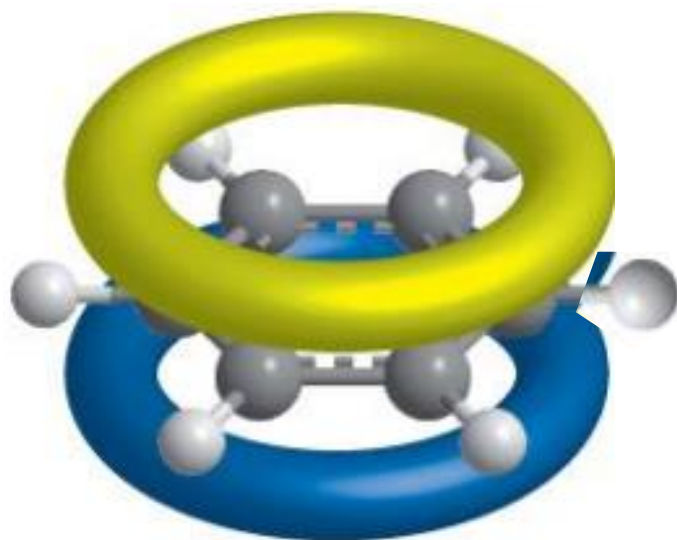


Alquenos - metabolismo

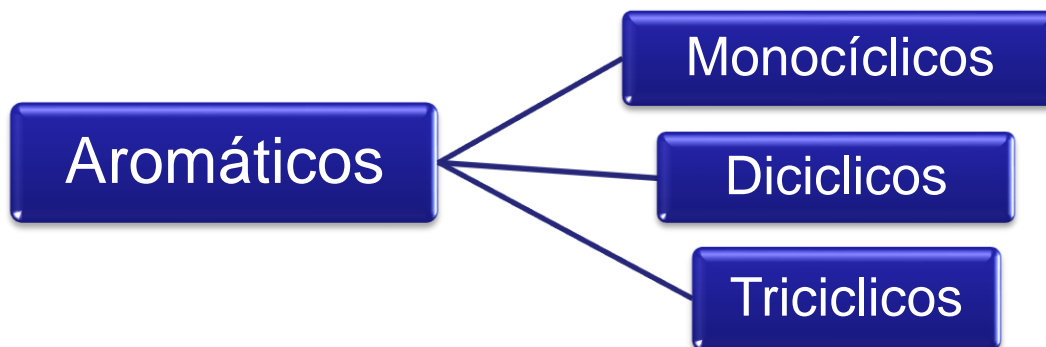
β -oxidación ácidos grasos /
Oxidación-hidratación



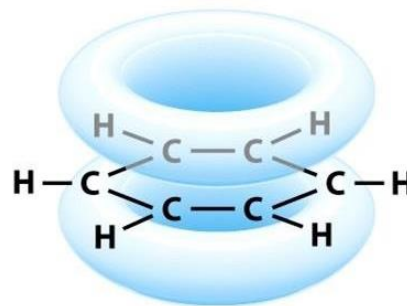
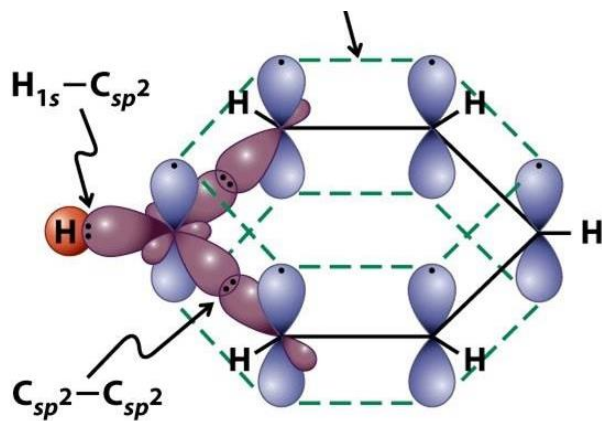
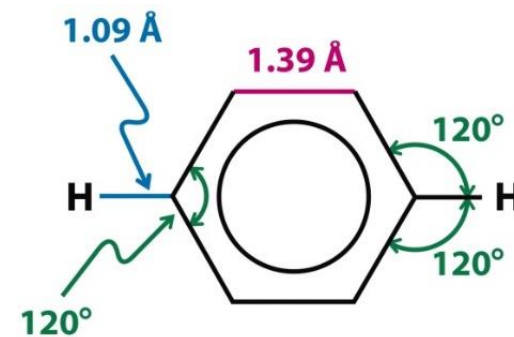
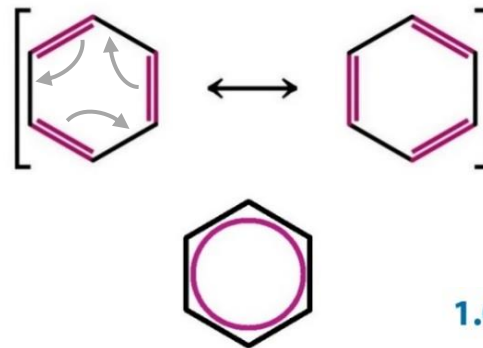
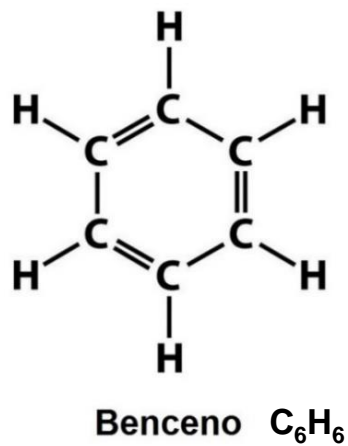
HIDROCARBUROS AROMÁTICOS



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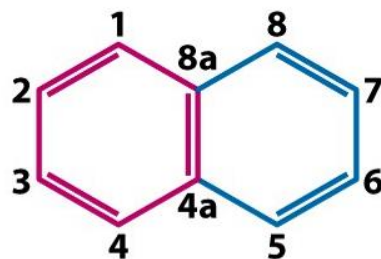
Benceno



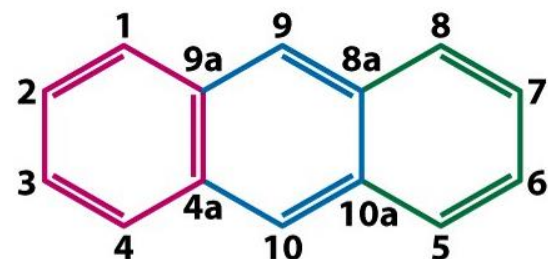
Regla de Hückel

Una molécula es **aromática** cuando:

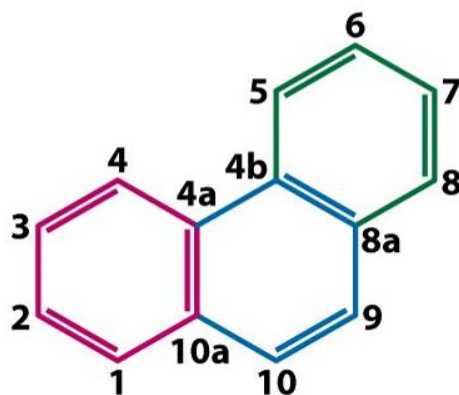
- Es **cíclica**
- Posee **enlaces π** conjugados (orbitales p en todos los C).
- Es **plana**
- Contiene un total de **$4n+2$** electrones en los orbitales p (donde $n \geq 1$)



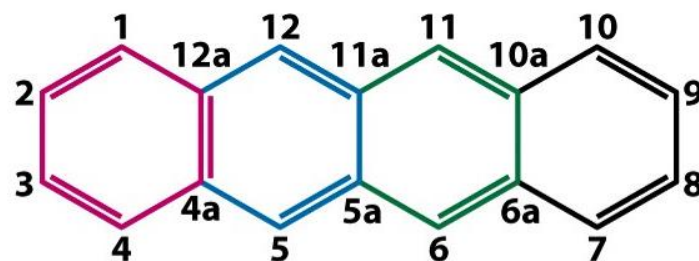
Naftaleno



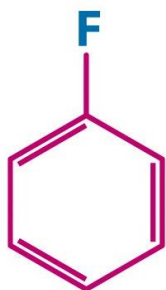
Antraceno



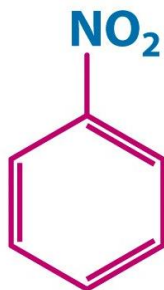
Fenantreno



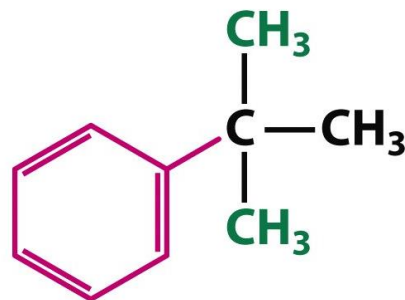
Tetraceno



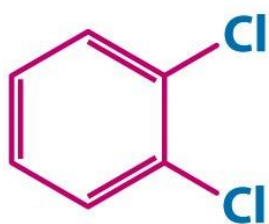
Fluorobenceno



Nitrobenceno



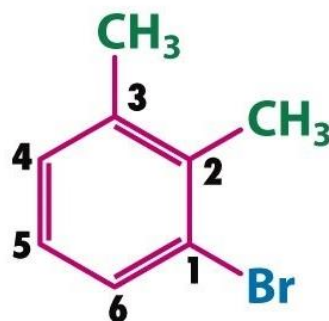
(1,1-Dimetiletil)enceno
(*tert*-butilenceno)



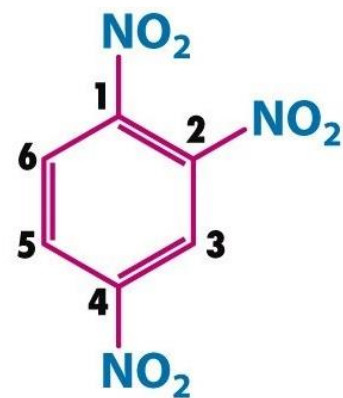
1,2-Diclorobenceno
(*o*-Diclorobenceno)



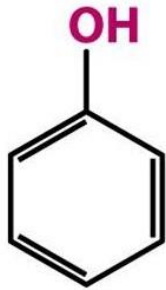
1-Bromo-3-nitrobenceno
(*m*-Bromonitrobenceno)



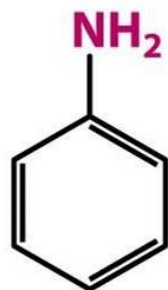
1-Bromo-2,3-dimetil
benceno



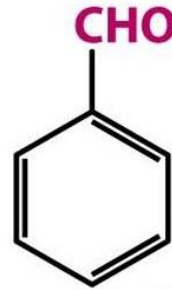
1,2,4-Trinitrobenceno



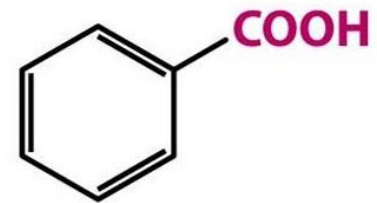
Fenol



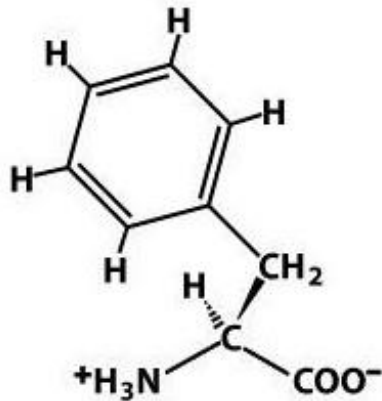
Anilina



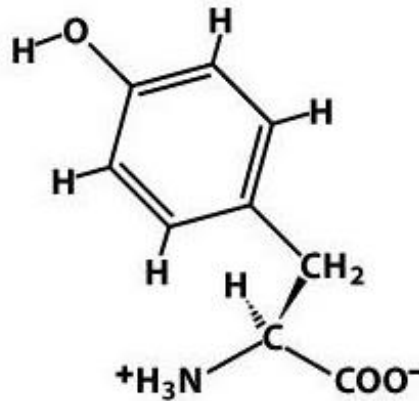
Benzaldehido



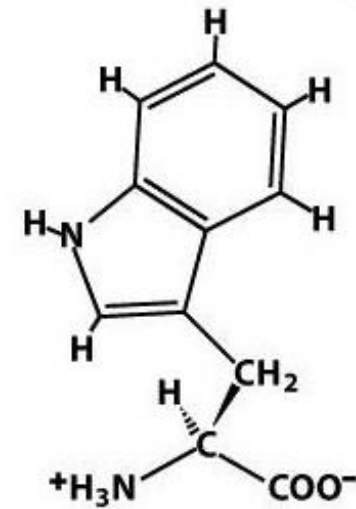
**Acido
Benzoico**



Fenilalanina

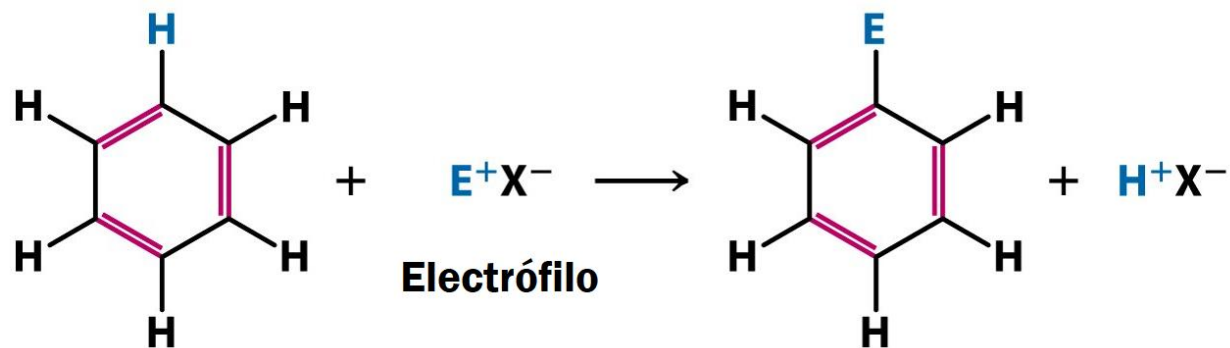
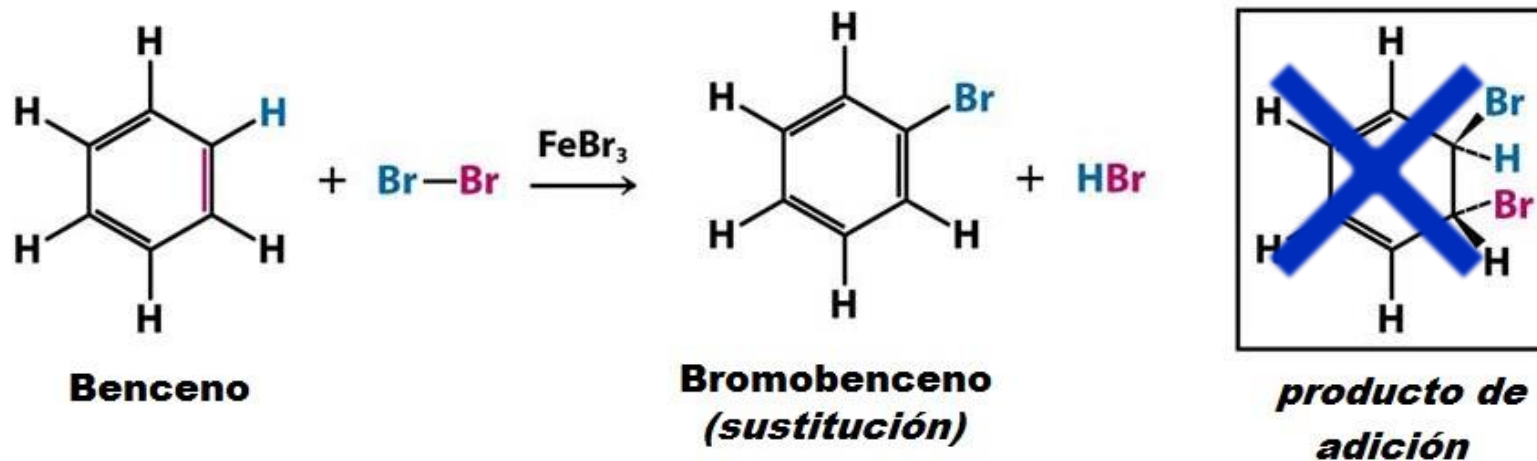


Tirosina

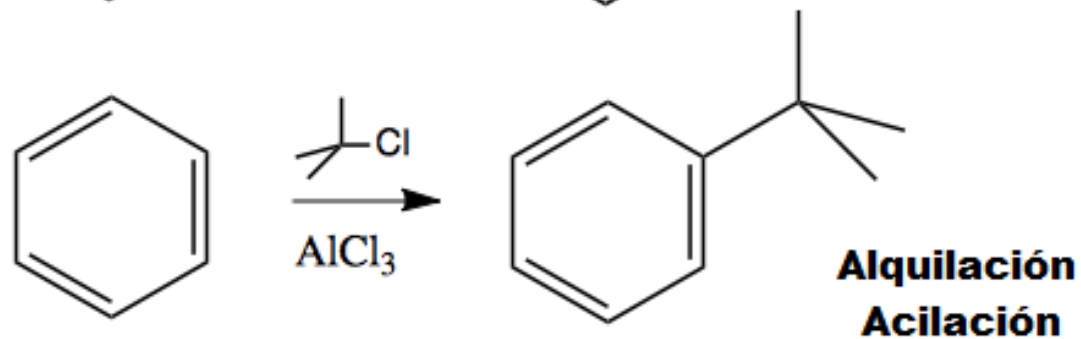
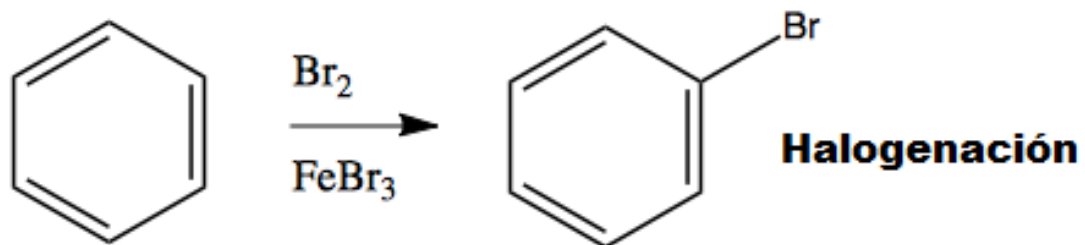
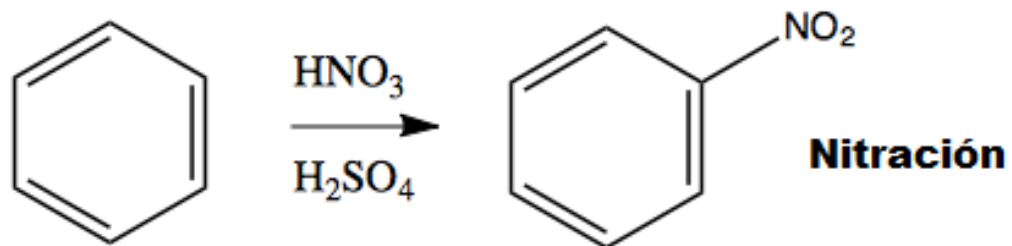


Triptofano

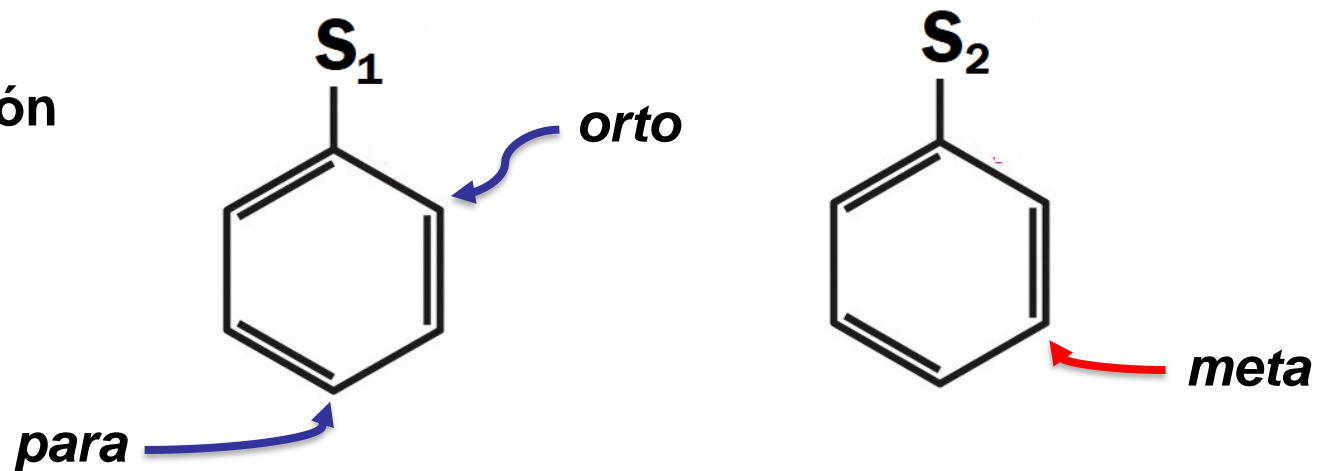
Benceno – Sustitucion electrofílica aromática (SEA)



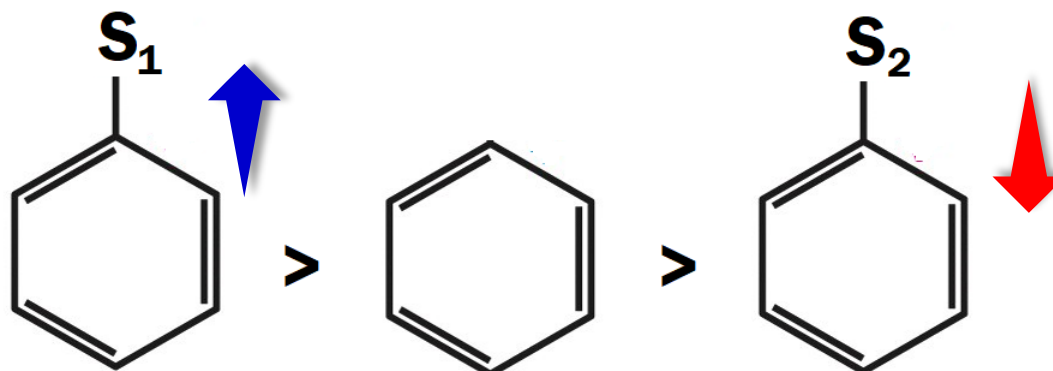
SEA - ejemplos



Orientación

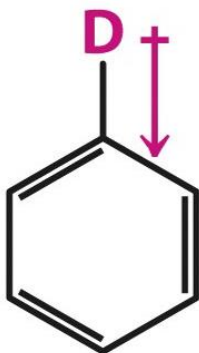


Reactividad



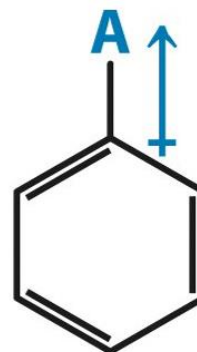
- El sustituyente ya presente (D o A) puede generar un efecto inductivo mediante la polarización de **enlaces sigma** por diferencia de electronegatividad entre C–D o C–A

Dadores



**D = $-\text{CH}_3$;
otros alquilos**

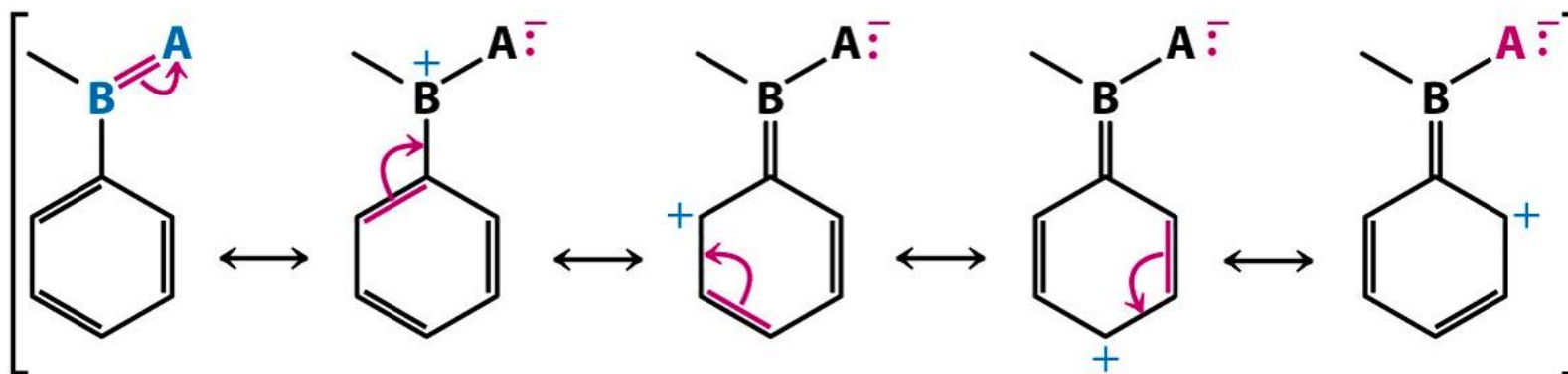
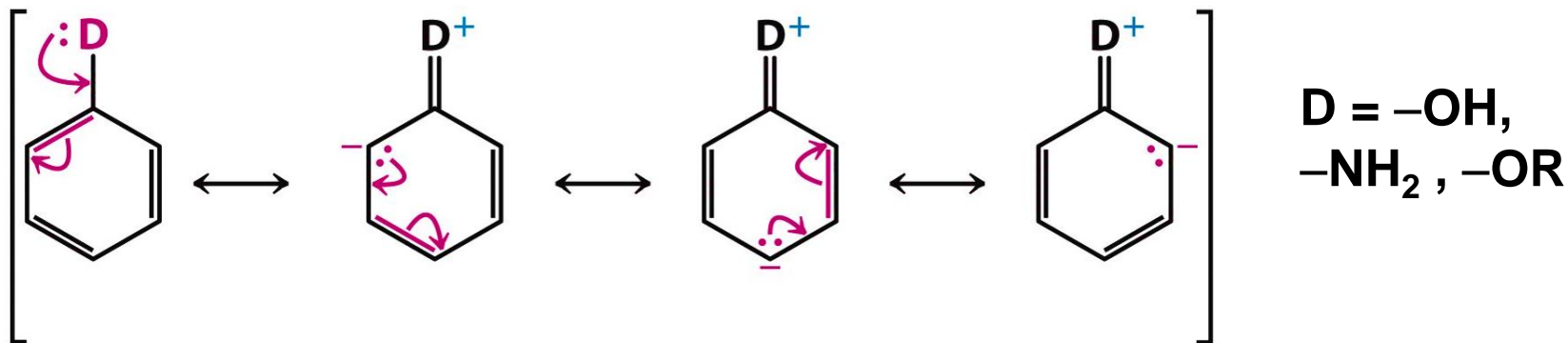
Atractores



**A = $-\text{X}$, $-\text{OR}$, $-\text{COR}$,
 $-\text{NO}_2$, $-\text{CN}$, $-\text{SO}_3\text{H}$**

Sustituyentes – resonancia

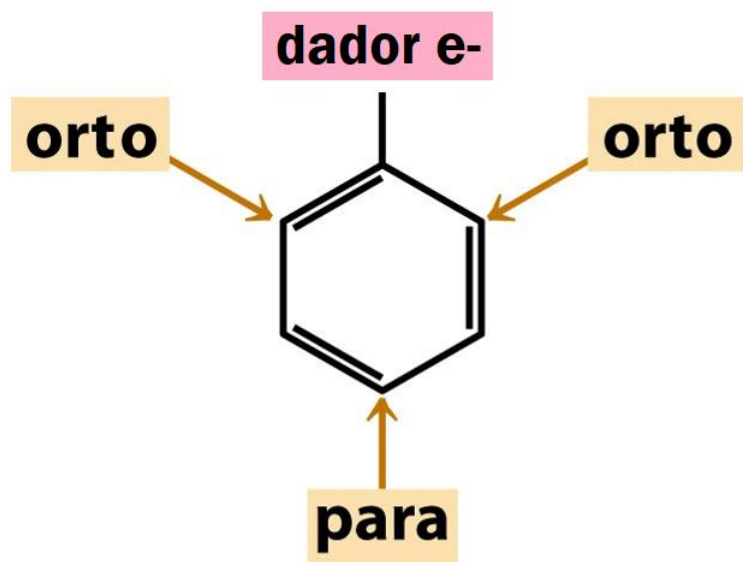
- Los electrones de los orbitales π del anillo aromático pueden deslocalizarse por efecto del sustituyente



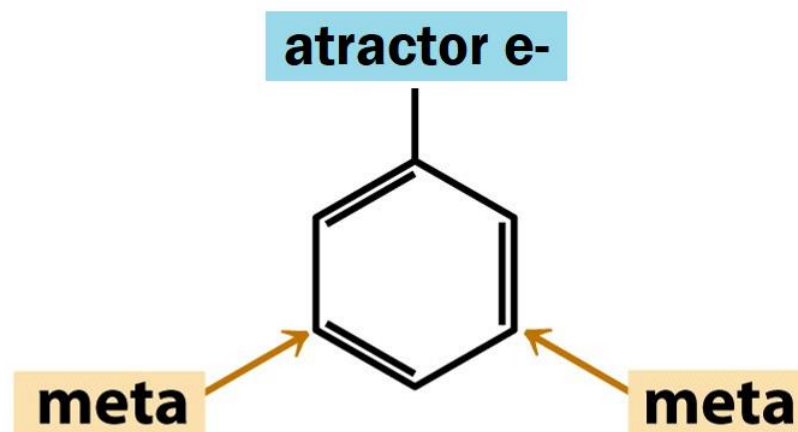
Reactividad y orientación - Resumen

<i>Sustituyente</i>	<i>Nombre</i>	<i>Orientación</i>	<i>Reactividad</i>
-NH ₂	Amino	orto, para	Activa (++)
-NHR, -NR ₂	Alquilamino	orto, para	Activa (++)
-OH	Hidroxi	orto, para	Activa (+)
-OR	Alcoxi	orto, para	Activa (+)
-R	Alquil	orto, para	Activa
-Ar	Aril	orto, para	Activa
-H	Hidrógeno	---	<i>Estandar</i>
-X	Halógenos	orto, para	Desactiva
-COR	Acil	meta	Desactiva (+)
-COOH	Carboxi	meta	Desactiva (+)
-SO ₃ H	Sulfónico	meta	Desactiva (+)
-CN	Ciano	meta	Desactiva (+)
-NO ₂	Nitro	meta	Desactiva (++)

En resumen.....



El anillo se activa



El anillo se desactiva

Bibliografía

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Vollhardt-Schore, 5a Ed 2007

Schmid, 1ª Ed, 1996

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