



NOMENCLATURA DE COMPUESTOS ORGÁNICOS

UNIDAD 1

QUÍMICA ORGÁNICA
2026

CONTENIDOS

Aprenderemos cómo nombrar los siguientes compuestos orgánicos:

- *Alcanos, alquenos y alquinos.*
- *Hidrocarburos alicíclicos.*
- *Hidrocarburos aromáticos.*
- *Haluros de alquilo.*
- *Alcoholes.*
- *Éteres.*
- *Aldehídos y cetonas.*
- *Ácidos carboxílicos, ésteres y amidas.*
- *Aminas.*

HIDROCARBUROS



ALCANOS

01



**Hidrocarburos
saturados.**

02



Se encuentran
principalmente
en el **gas natural**
y el **petróleo**

03



ALCANOS NO RAMIFICADOS O ALCANOS NORMALES

Nombre: Prefijo que indica el n° de carbonos + ano

Hepta + ano



Heptano



Metano



Etano



Propano



Butano



Pentano



Hexano



Heptano



Octano



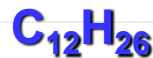
Nonano



Decano



Undecano



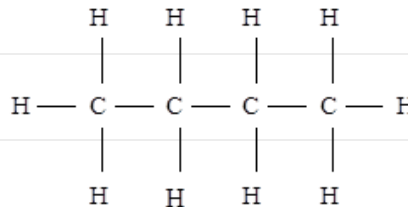
Dodecano

APRENDIENDO A ESCRIBIR FÓRMULAS

¿Cómo se puede escribir butano?



- Mediante su **fórmula molecular**: C_4H_{10}
- Mediante su **fórmula estructural desarrollada**:



- Mediante su **fórmula estructural condensada**:
 $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_3$
- Mediante su **fórmula estructural de esqueleto**:



GRUPOS ALQUILO



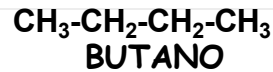
Eliminando un átomo de hidrógeno en un hidrocarburo saturado se obtiene un:

GRUPO ALQUILO O RADICAL ALQUILO



CONSTRUCCIÓN DEL NOMBRE

Alcano de igual número de átomos de carbono

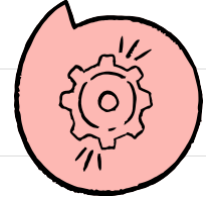


Terminación de la nomenclatura

-ANO → -ILO → -IL

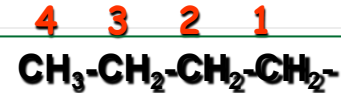
BUTANO → BUTILO → BUTIL

Nombre del grupo alquilo



NUMERACIÓN

Se comienza a numerar por el carbono que presenta la valencia libre



Nombre como sustituyente

NOMBRE DE LOS GRUPOS ALQUILOS SENCILLOS

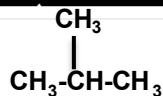
R-

ALCANOS	RADICALES	NOMBRES
CH_4 METANO	CH_3^-	METILO (Me)
$\text{CH}_3\text{-CH}_3$ ETANO	$\text{CH}_3\text{-CH}_2^-$	ETILO (Et)
$\text{CH}_3\text{-CH}_2\text{-CH}_3$ PROPANO	$\text{CH}_3\text{-CH}_2\text{-CH}_2^-$	PROPILO (Pr)
	$\begin{array}{c} \\ \text{CH}_3\text{-CH-CH}_3 \end{array}$	ISOPROPILO (Pri, i-Pr)
$\text{CH}_3\text{-CH}_2\text{-CH}_2\text{-CH}_3$ BUTANO	$\text{CH}_3\text{-CH}_2\text{-CH}_2\text{-CH}_2^-$	BUTILO (Bu)
	$\begin{array}{c} \\ \text{CH}_3\text{-CH}_2\text{-CH-CH}_3 \end{array}$	SEC-BUTILO (Bu ^s , s-Bu)

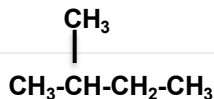
NOMBRES PROPIOS DE ALCANOS RAMIFICADOS Y SUS RADICALES

R-

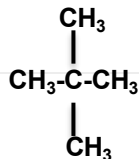
ALCANOS RAMIFICADOS



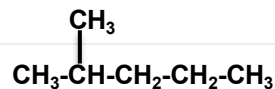
ISOBUTANO



ISOPENTANO

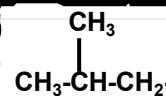


NEOPENTANO

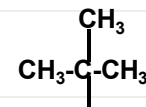


ISOHEXANO

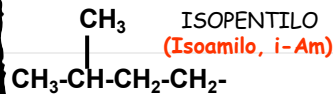
RADICALES RAMIFICADOS



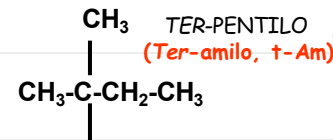
ISOBUTILO
(Buⁱ, i-Bu)



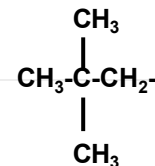
TER-BUTILO
(Bu^t, t-Bu)



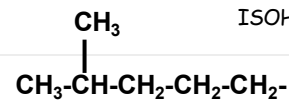
ISOPENTILO
(Isoamilo, i-Am)



TER-PENTILO
(Ter-amilo, t-Am)



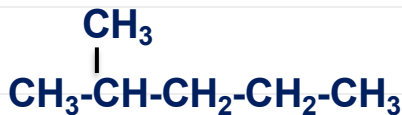
NEOPENTILO



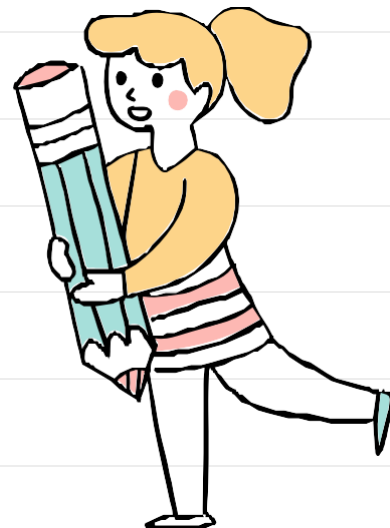
ISOHEXILO

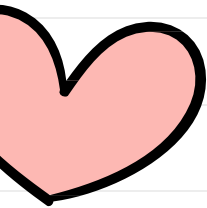
NOMENCLATURA IUPAC DE LOS COMPUESTOS DEL CARBONO

ALCANOS RAMIFICADOS



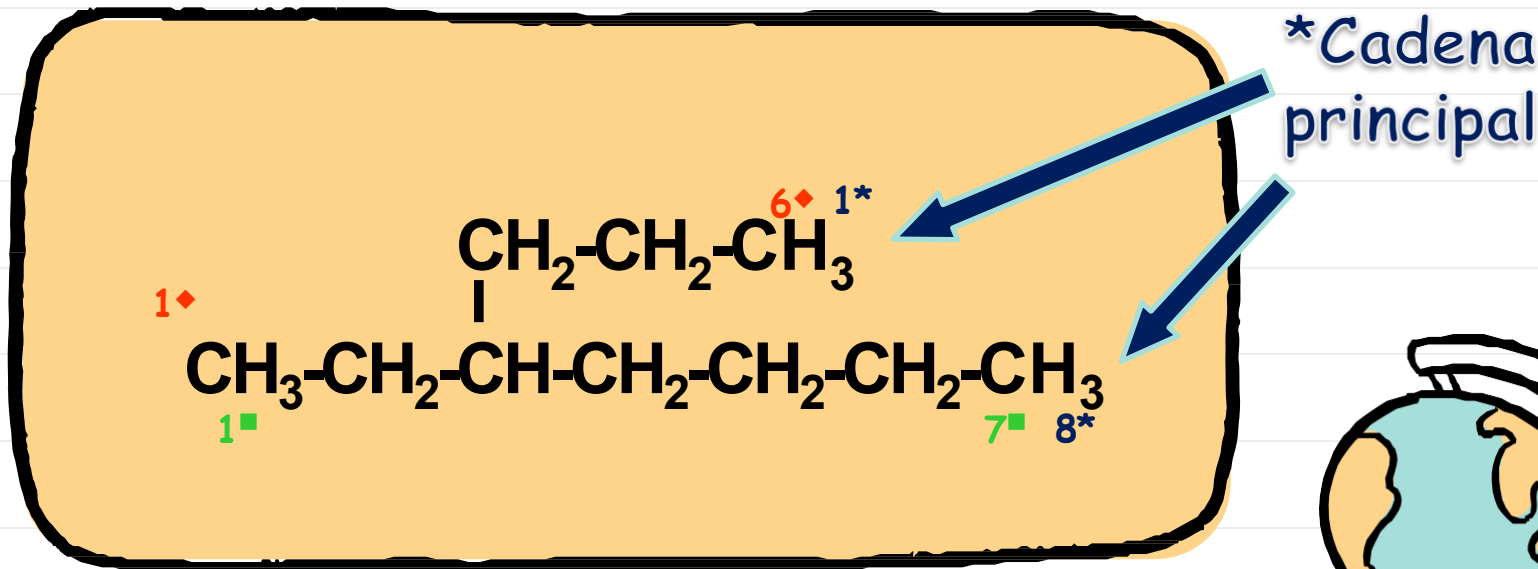
- **Nombre base**: el de la *cadena principal* que es la cadena de átomos de carbono continua más larga.
- **Sustituyentes**: grupos unidos a la cadena principal.
Cada sustituyente se localiza por su nombre y por el número del átomo de carbono al cual está unido.

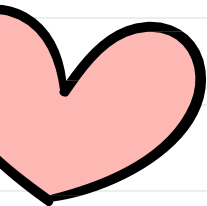




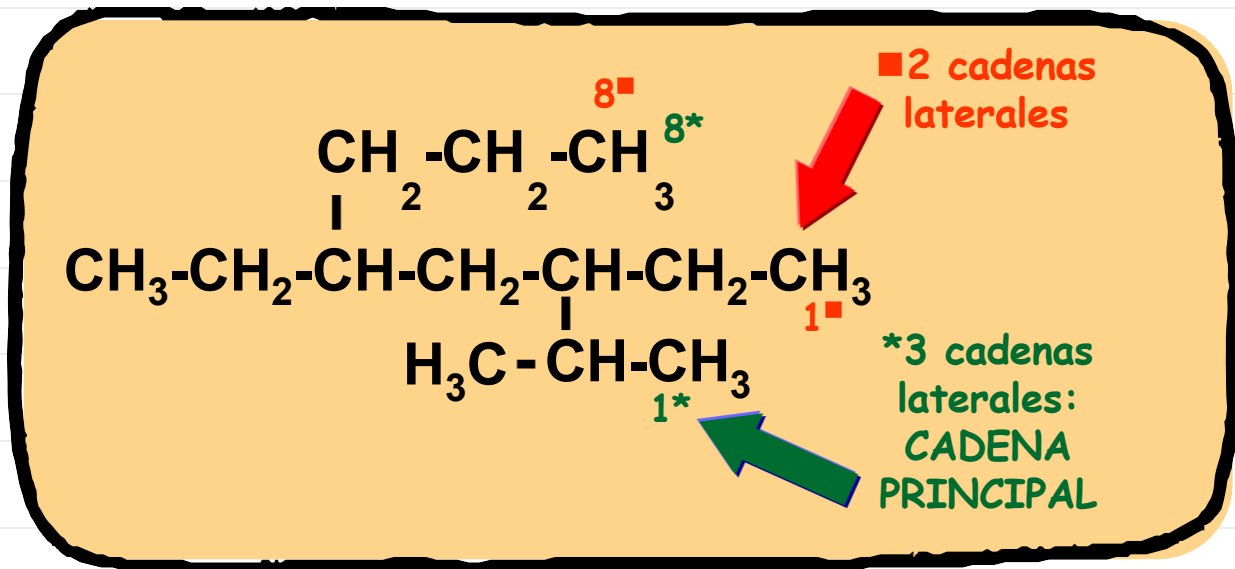
1. Elección de la cadena principal

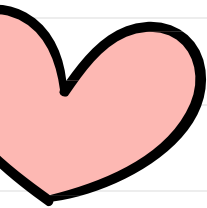
1.1. Se elige la cadena de mayor número de átomos de carbono





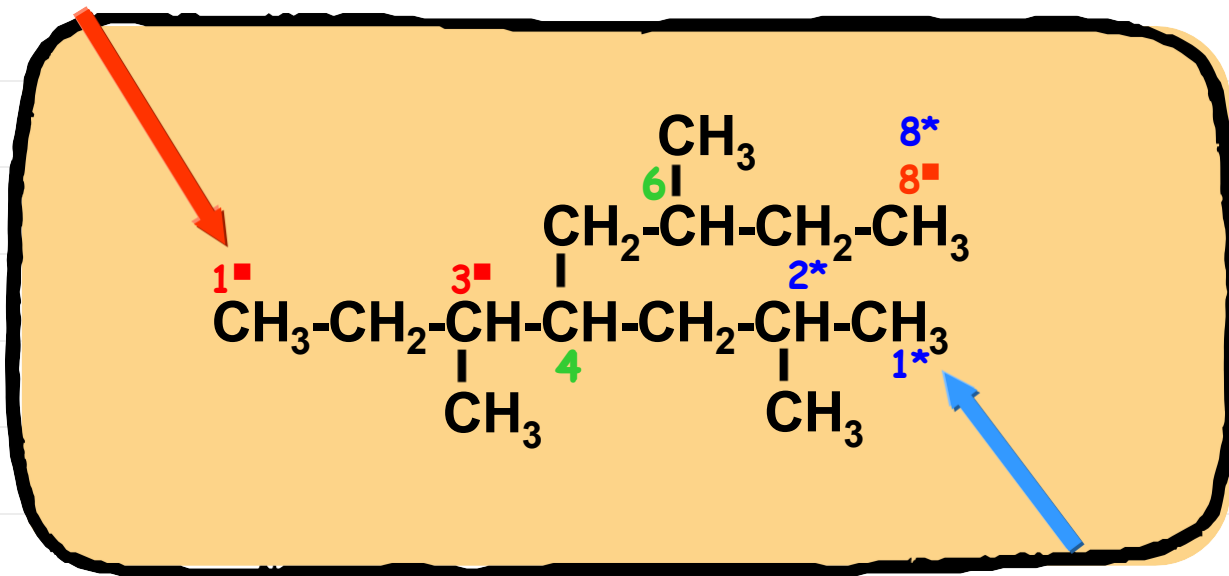
1.2. Aquella de mayor número de cadenas laterales





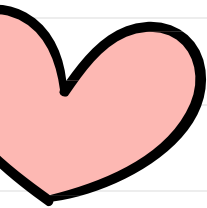
1.3. Aquella de cadenas laterales con localizador más bajo

- 8 carbonos
- 3 ramificaciones en 3, 4 y 6



*8 carbonos
3 ramificaciones en 2, 4 y 6
CADENA PRINCIPAL

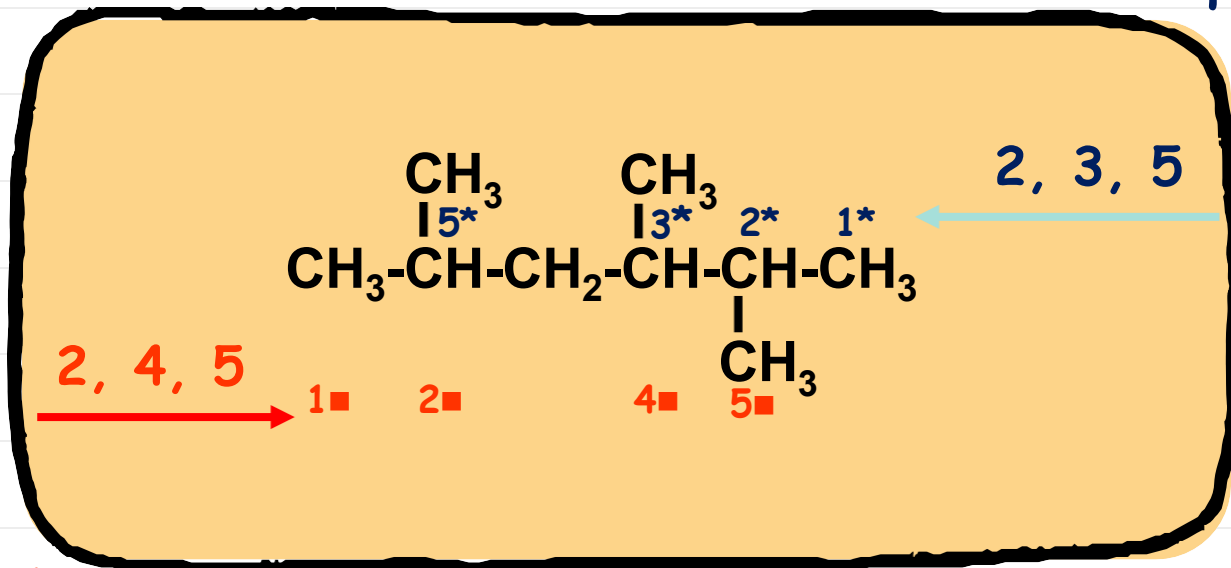




2. La Numeración

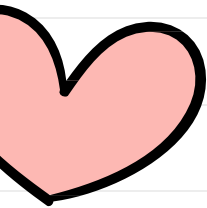
2.1. Números más bajos a los sustituyentes

***NUMERACIÓN
CORRECTA**



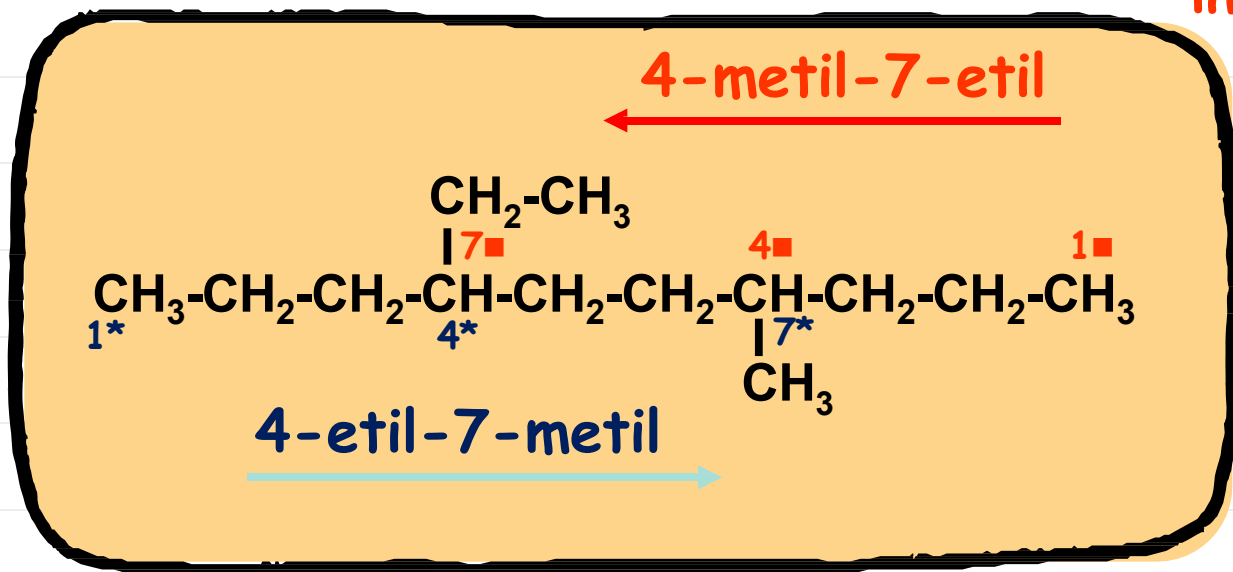
■ Numeración
incorrecta





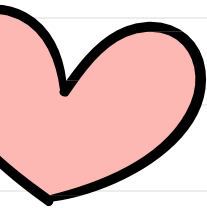
2.2 Números más bajos a los sustituyentes por orden alfabético

■ Numeración incorrecta



*E antes que M
NUMERACIÓN CORRECTA



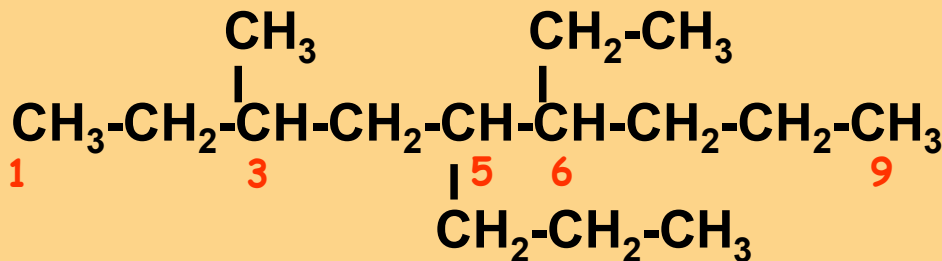


3. El nombre

Localizadores-Sustituyentes
(cadenas laterales)

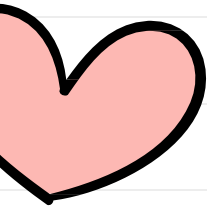
+ Nombre Alcano
(cadena principal)

3.1. Se anteponen los nombres de los sustituyentes por orden alfabético acompañados de su localizador

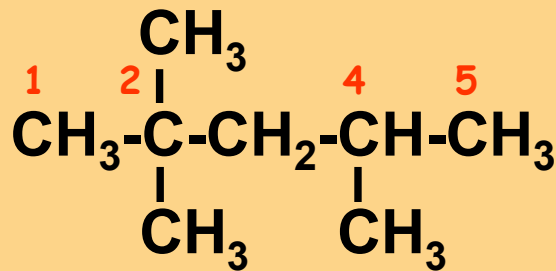


6-Etil-3-metil-5-propilnonano



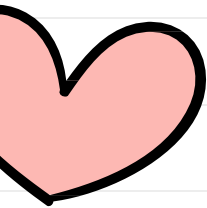


3.2. Sustituyentes repetidos en el mismo y/u otro carbono repiten el número y utilizan prefijos multiplicativos (di, tri, tetra, etc)



2,2,4-Trimetilpentano





- 3.3. Los prefijos multiplicativos (di-, tri-, tetra, etc) no se alfabetizan
4. Los prefijos n-, sec-, ter- no se alfabetizan
5. Los prefijos iso, neo y ciclo si se alfabetizan y se escriben sin guión



4-ter-Butil-5-isobutil-2,7-dimetilnonano

*

*

*



ALQUENOS

- Para designar un *doble enlace* $C=C$, se usa la terminación **eno**
- **Dieno, trieno**, etc para más de un doble enlace.

ALQUINOS

- Para un *triple enlace* se utiliza la terminación **ino**
- **Diino** para dos triples enlaces.

- **Eninos**: compuestos con un doble y un triple enlace.

PASOS PARA LA NOMENCLATURA:

01

Se debe seleccionar la cadena más larga que incluya **ambos** carbonos del doble o triple enlace.

02

Numerar la cadena a partir del extremo más **cercano al enlace múltiple**. (Los átomos de C de dicho enlace deben tener los números más pequeños posibles)

03

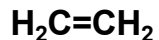
Si el enlace múltiple es equidistante a ambos extremos de la cadena, la numeración empieza a partir del extremo más cercano a la **1ª ramificación**

04

Indicar la posición del enlace múltiple mediante el número del **primer** carbono de dicho enlace.

EJEMPLOS

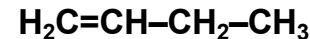
Eteno (etileno)



Propeno (propileno)



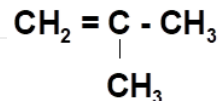
1-buteno



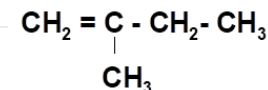
2-buteno



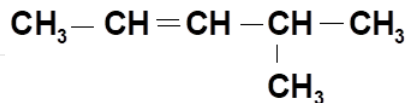
Metilpropeno (Isobutileno)



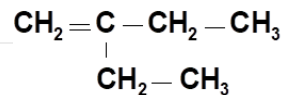
2-metil-1-buteno



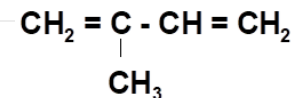
4-metil-2-penteno



2-etil-1-buteno



2-metil-1,3-butadieno



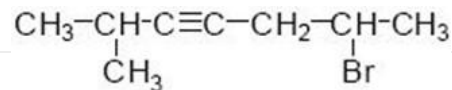
acetileno



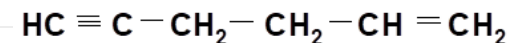
2-butino



6-bromo-2-metil-3-heptino



1-hexen-5-ino

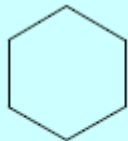


HIDROCARBUROS ALIFÁTICOS CÍCLICOS

01



CICLOALCANOS

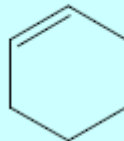


ciclohexano

02



CICLOALQUENOS

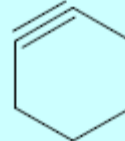


ciclohexeno

03



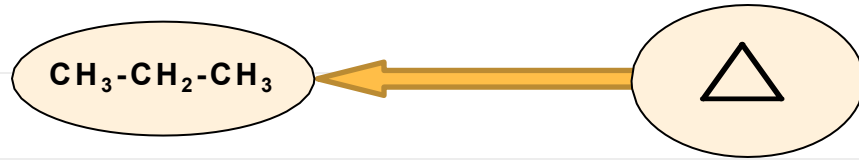
CICLOALQUINOS



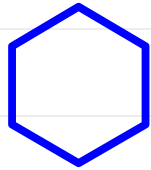
ciclohexino

1.1. Se antepone el prefijo **ciclo-** al nombre del alcano de igual número de carbonos

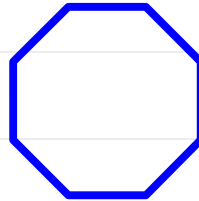
Cicloalcano



Propano  **Ciclo**propano

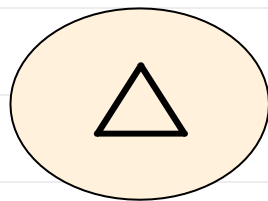


Ciclohexano

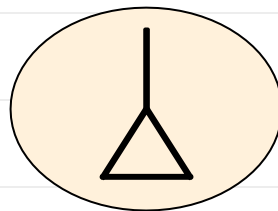


Ciclooctano

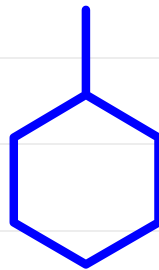
1.2. Los radicales se nombran cambiando -ano por -ilo



Cicloprop**ano**

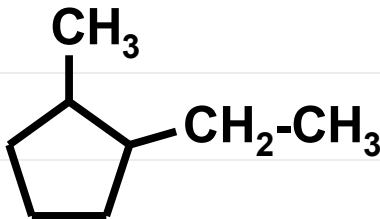


Cicloprop**ilo**

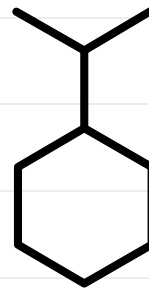


Ciclohex**ilo**

1.3. Cicloalcanos sustituidos: Se utilizan las mismas reglas que para alcanos. Cuando sólo hay un sustituyente, **no** se precisa localizador.

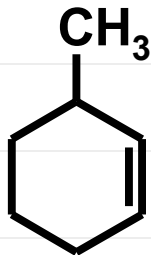


1-Etil-2-metilciclopentano

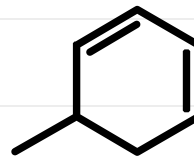


Isopropilciclohexano

1.4. Cicloalquenos y cicloalquinos: Se utilizan las mismas reglas que para alquenos y alquinos.



3-Metilciclohexeno

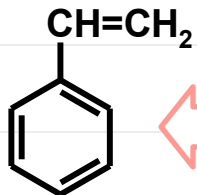


5-Metil-1,3-ciclohexadieno

HIDROCARBUROS AROMÁTICOS

Nombre: localizadores + sustituyentes + benceno

MONOSUSTITUÍDOS

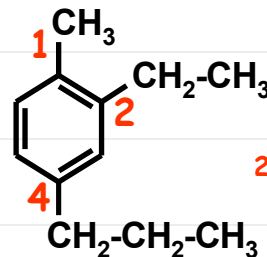


No necesita
localizador
6 carbonos
equivalentes



POLISUSTITUÍDOS

Numeración: Se dan los nº más bajos a los sustituyentes



2-Etil-1-metil-4-propilbenceno

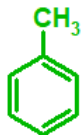
NOMBRES PROPIOS Y SUS RADICALES



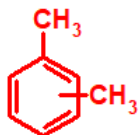
BENCENO Y SUS DERIVADOS



BENCENO



TOLUENO



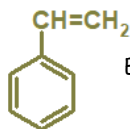
o-XILENO

m-XILENO

p-XILENO

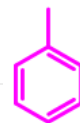


MESITILENO

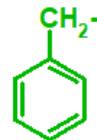


ESTIRENO

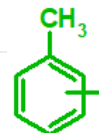
RADICALES ARILO



FENILO
(Ph-)



BENCILO



o-TOLILO
m-TOLILO
p-TOLILO

Disustituídos

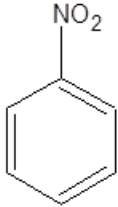
orto- → o- → 1,2-

meta- → m- → 1,3-

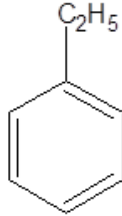
para- → p- → 1,4-

EJEMPLOS

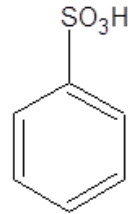
Nitrobenzeno



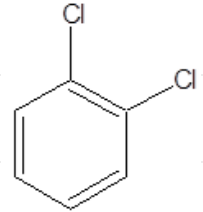
Etilbenzeno



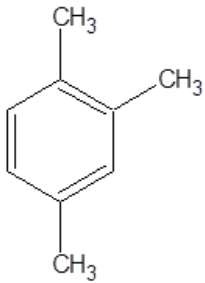
Ácido bencenosulfónico



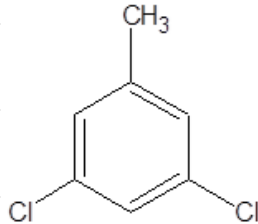
o-diclorobenceno



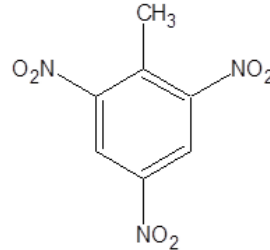
1,2,4-trimetilbenceno



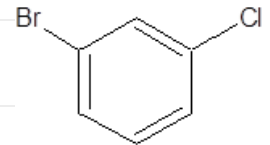
3,5-diclorotolueno



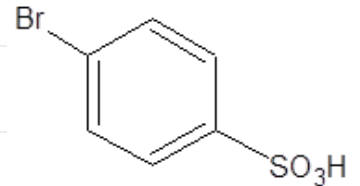
2,4,6-trinitrotolueno (TNT)



m-bromoclorobenceno



Ác. p-bromobencenosulfónico

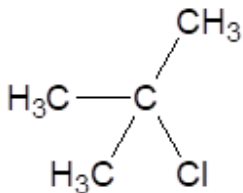




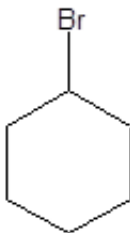
HALOGENUROS DE ALQUILO Y ARILO

R-X

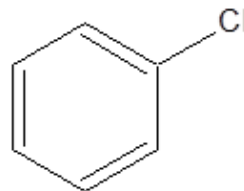
Ar-X



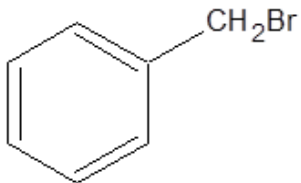
2-cloro-2-metilpropano
Cloruro de t-butilo



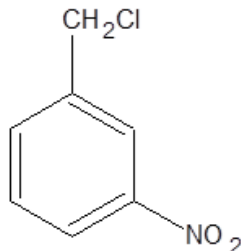
Bromociclohexano
Bromuro de ciclohexilo



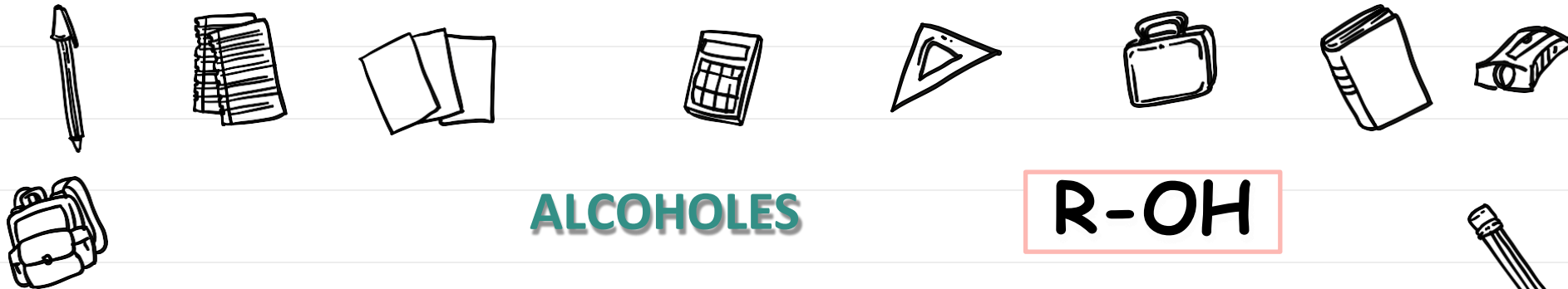
Clorobenceno



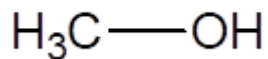
Bromuro de bencilo



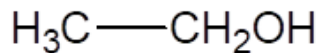
Cloruro de m-nitrobencilo



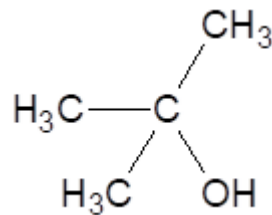
ALCOHOLES



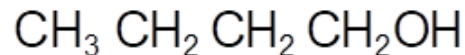
Metanol
Alcohol metílico



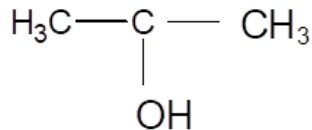
Etanol
Alcohol etílico



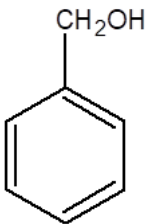
2-metil-2-propanol
Alcohol t-butílico



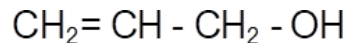
1-butanol
Alcohol n-butílico



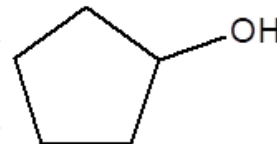
2-propanol
Alcohol isopropílico



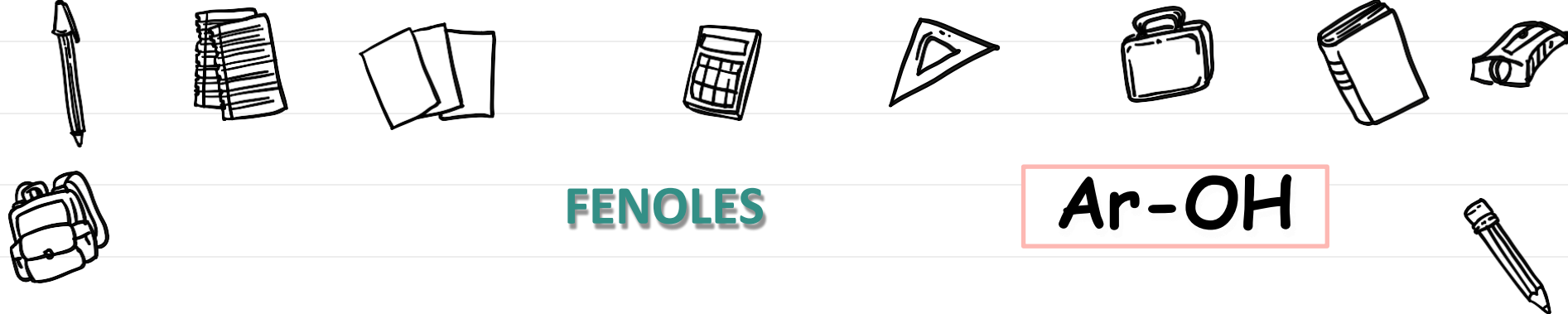
Alcohol bencílico



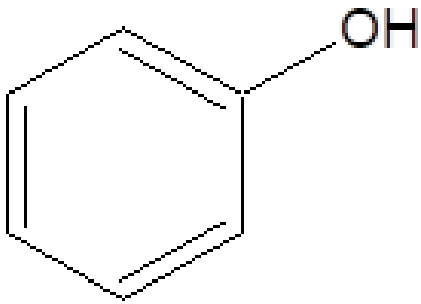
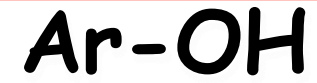
2-propen-1-ol



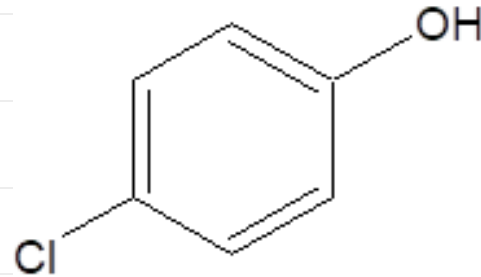
Ciclopentanol
Alcohol ciclopentílico



FENOLES



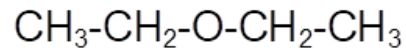
FENOL



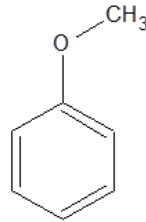
p-CLOROFENOL



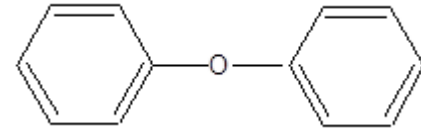
ÉTERES



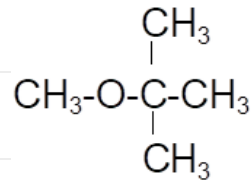
Dietiléther
Éther etílico



Fenilmetiléther
Anisol



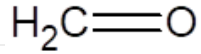
Difeniléther



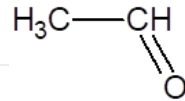
t-butylmetiléther



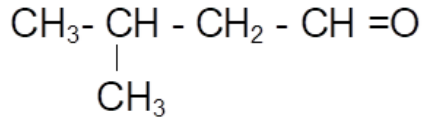
ALDEHÍDOS Y CETONAS



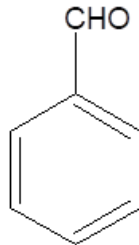
METANAL
(Formaldehído)



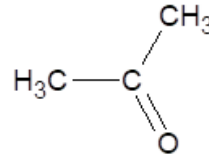
ETANAL
(Acetaldehído)



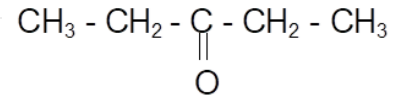
3-metilbutanal



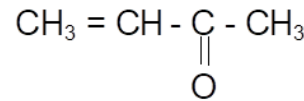
BENZALDEHÍDO



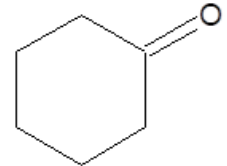
PROPANONA
(Acetona)



3-pentanona



3-buten-2-ona

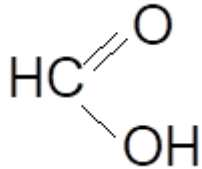


CICLOHEXANONA

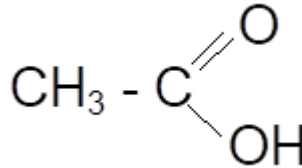




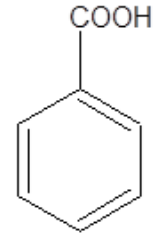
ÁCIDOS CARBOXÍLICOS



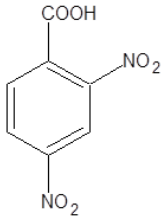
Ácido metanoico
(Ácido fórmico)



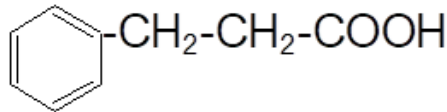
Ácido etanoico
(Ácido Acético)



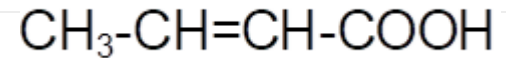
Ácido benzoico



Ácido 2,4-dinitrobenzoico



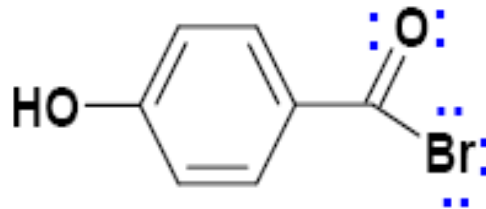
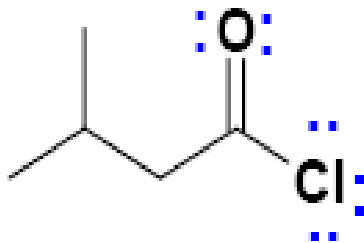
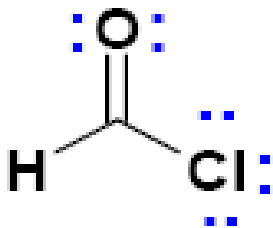
Ácido 3-fenilpropanoico



Ácido 2-butenoico



HALUROS DE ACILO



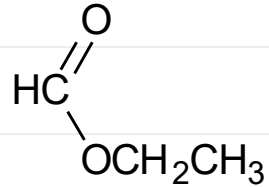
Cloruro de metanoilo
(Cloruro de formilo)

Cloruro de 3-metilbutanoilo
(Cloruro de isovaleroilo)

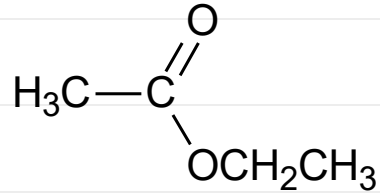
Bromuro de p-hidroxibenzoilo



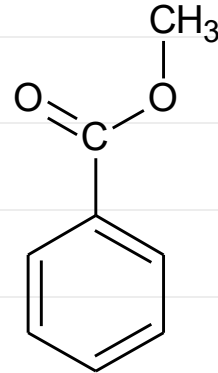
ÉSTERES



Metanoato de etilo
(Formiato de etilo)



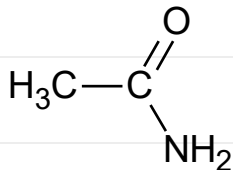
Etanoato de etilo
(Acetato de etilo)



Benzoato de metilo

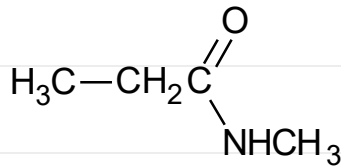
AMIDAS

PRIMARIAS



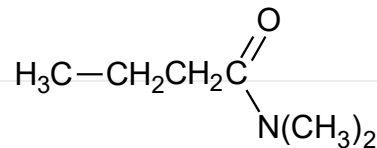
etanamida

SECUNDARIAS



N-metilpropanamida

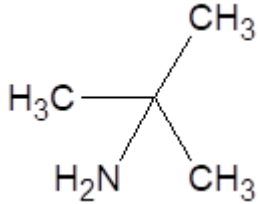
TERCIARIAS



N,N-dimetilbutanamida

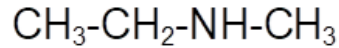
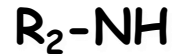
AMINAS

PRIMARIAS



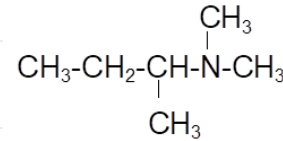
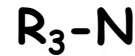
t-butilamina

SECUNDARIAS



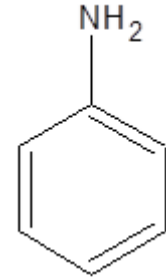
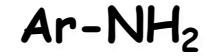
etilmetilamina

TERCIARIAS



sec-butildimetilamina

AROMÁTICAS



Anilina

MUCHAS GRACIAS!

