

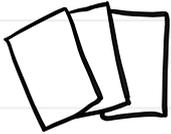


# CONTENIDOS

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

$\text{CH}_4$	Metano
$\text{C}_2\text{H}_6$	Etano
$\text{C}_3\text{H}_8$	Propano
$\text{C}_4\text{H}_{10}$	Butano
$\text{C}_5\text{H}_{12}$	Pentano
$\text{C}_6\text{H}_{14}$	Hexano

$\text{C}_7\text{H}_{16}$	Heptano
$\text{C}_8\text{H}_{18}$	Octano
$\text{C}_9\text{H}_{20}$	Nonano
$\text{C}_{10}\text{H}_{22}$	Decano
$\text{C}_{11}\text{H}_{24}$	Undecano
$\text{C}_{12}\text{H}_{26}$	Dodecano



# GRUPOS ALQUILO



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

**GRUPO ALQUILO O RADICAL ALQUILO**



## CONSTRUCCIÓN DEL NOMBRE

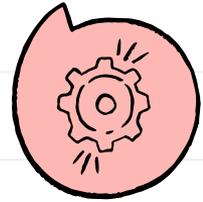
Alcano de igual número de átomos de carbono

$\text{CH}_3\text{-CH}_2\text{-CH}_2\text{-CH}_3$   
**BUTANO**

**-ANO → -ILO → -IL**

**BUTANO → BUTILO → BUTIL**

Nombre del grupo alquilo



## NUMERACIÓN

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

**4 3 2 1**  
 **$\text{CH}_3\text{-CH}_2\text{-CH}_2\text{-CH}_2\text{-}$**

Nombre como sustituyente

# NOMBRE DE LOS GRUPOS ALQUILOS SENCILLOS

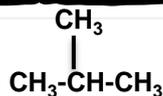
R-

ALCANOS	RADICALES	NOMBRES
$\text{CH}_4$ METANO	$\text{CH}_3^-$	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)
	$\begin{array}{c}   \\ \text{CH}_3-\text{CH}-\text{CH}_3 \end{array}$	ISOPROPILO (Pr <sup>i</sup> , 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)
	$\begin{array}{c}   \\ \text{CH}_3-\text{CH}_2-\text{CH}-\text{CH}_3 \end{array}$	SEC-BUTILO (Bu <sup>s</sup> , s-Bu)

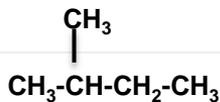
# NOMBRES PROPIOS DE ALCANOS RAMIFICADOS Y SUS RADICALES

R-

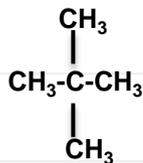
## ALCANOS RAMIFICADOS



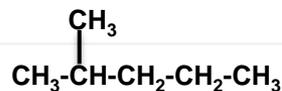
ISOBUTANO



ISOPENTANO

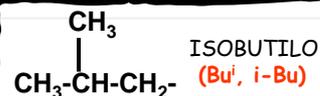


NEOPENTANO

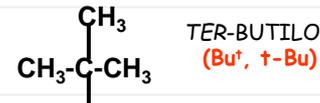


ISOHEXANO

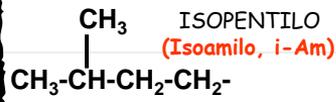
## RADICALES RAMIFICADOS



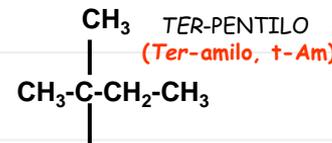
ISOBUTILO  
(Bu<sup>i</sup>, i-Bu)



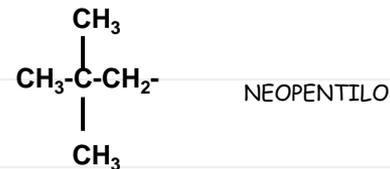
TER-BUTILO  
(Bu<sup>t</sup>, t-Bu)



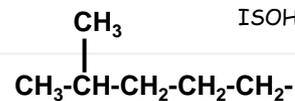
ISOPENTILO  
(Isoamilo, i-Am)



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



NEOPENTILO



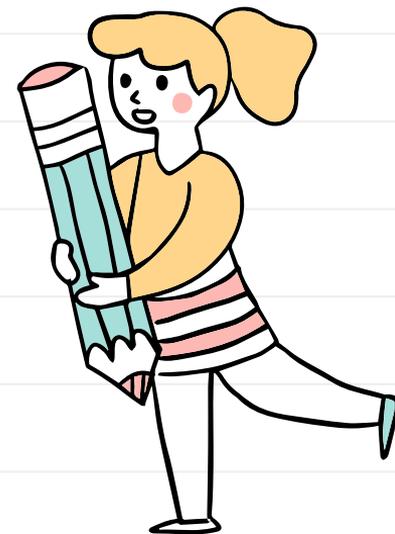
ISOHEXILO

# NOMENCLATURA IUPAC DE LOS COMPUESTOS DEL CARBONO

## ALCANOS RAMIFICADOS



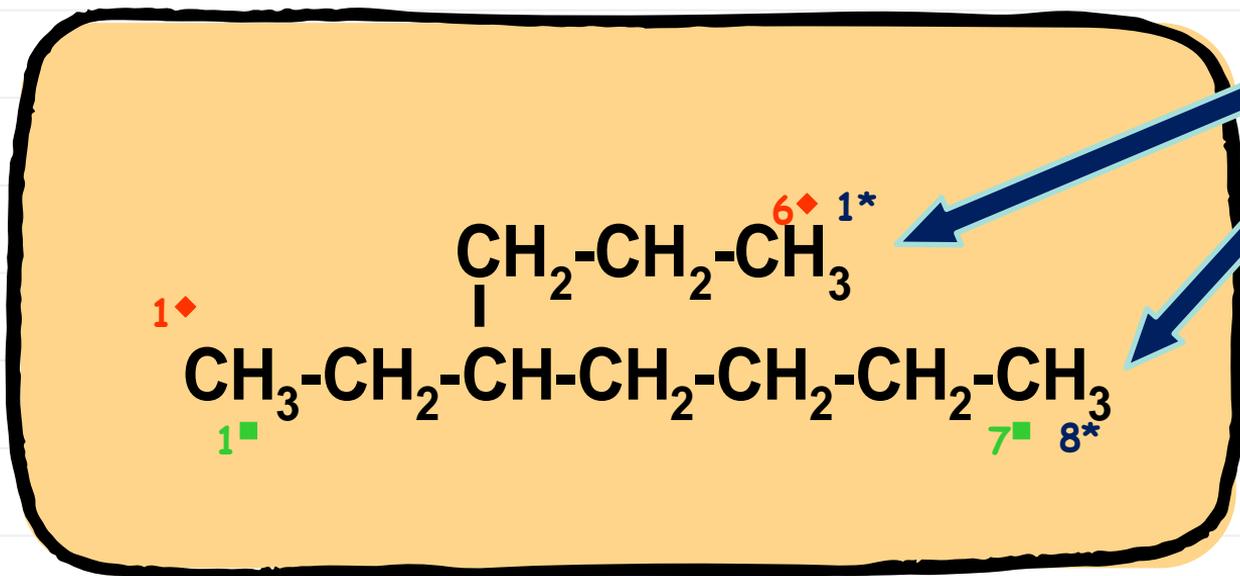
- **Nombre base**: el de la *cadena principal* que es la cadena de átomos de carbono continua más larga.
- **Sustituyentes**: grupos unidos a la cadena principal. Cada sustituyente se localiza por su nombre y por el número del átomo de carbono al cual está unido.





# 1. Elección de la cadena principal

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

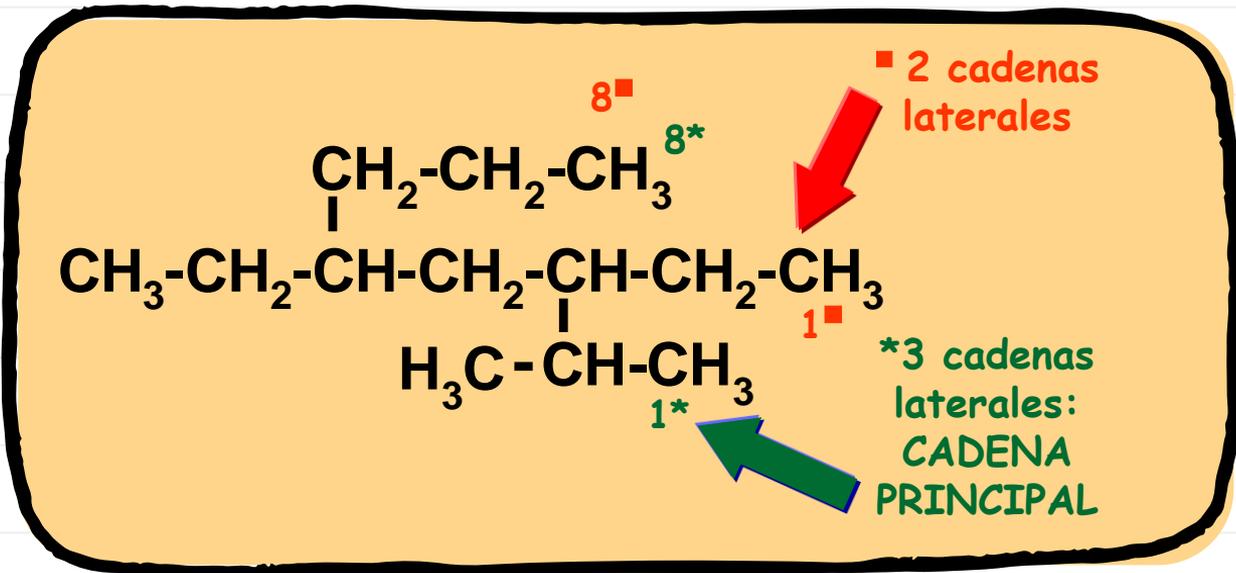


\*Cadena principal





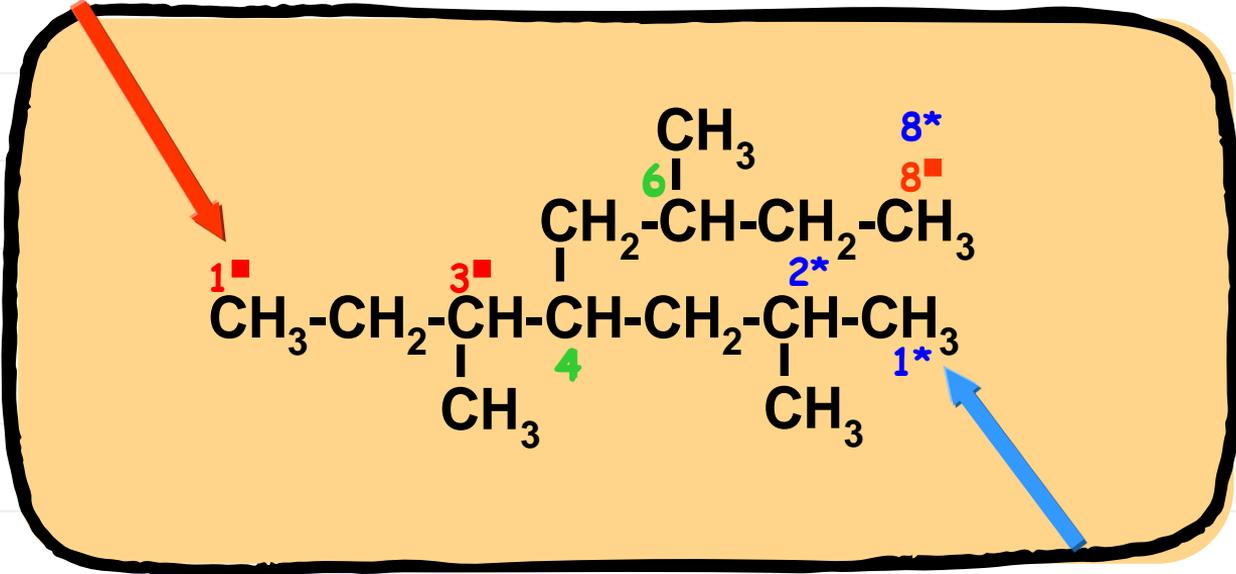
## 1.2. Aquella de mayor número de cadenas laterales





### 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**

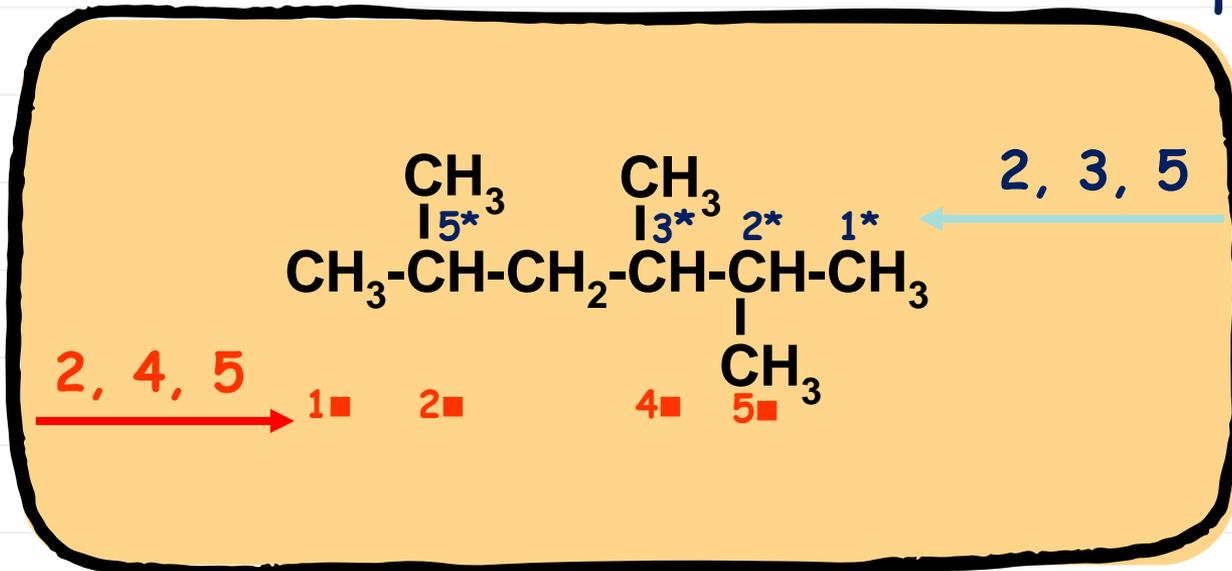




## 2. La Numeración

### 2.1. Números más bajos a los sustituyentes

**\*NUMERACIÓN  
CORRECTA**



■ Numeración incorrecta





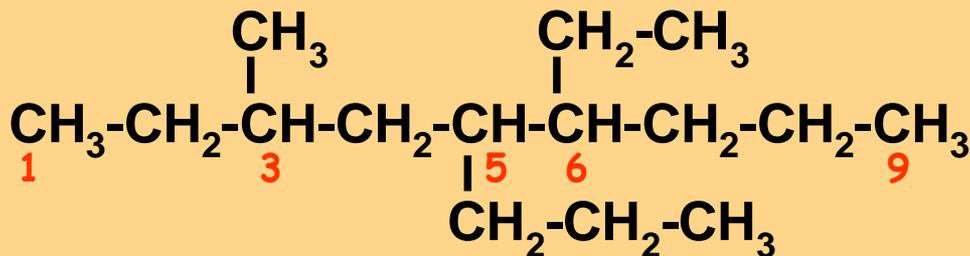


### 3. El nombre

Localizadores-Sustituyentes  
(cadenas laterales)

+ Nombre Alcano  
(cadena principal)

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

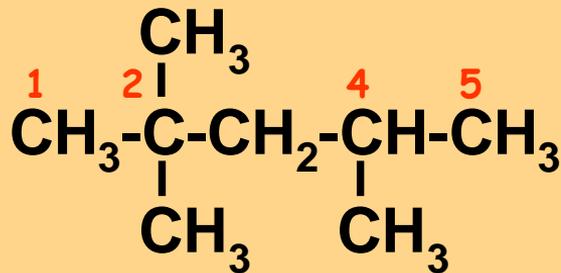


6-Etil-3-metil-5-propilnonano





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

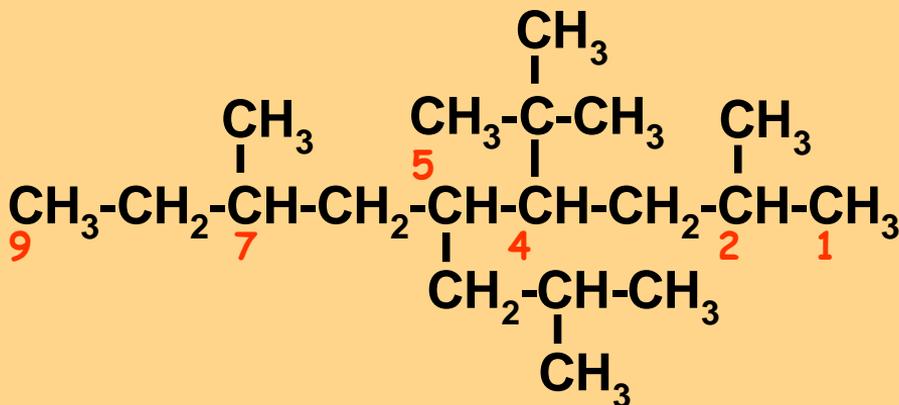




3.3. Los prefijos multiplicativos (di-, tri-, tetra, etc) no se alfabetizan

3.4. Los prefijos n-, sec-, ter- no se alfabetizan

3.5. 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 1º ramificación*

04

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

# EJEMPLOS

**Eteno (etileno)**



**Propeno (propileno)**



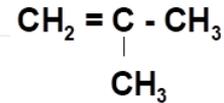
**1-buteno**



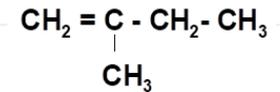
**2-buteno**



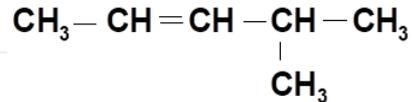
**Metilpropeno (Isobutileno)**



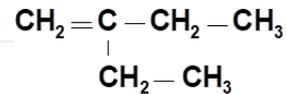
**2-metil-1-buteno**



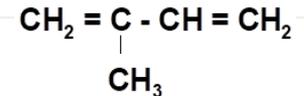
**4-metil-2-penteno**



**2-etil-1-buteno**



**2-metil-1,3-butadieno**



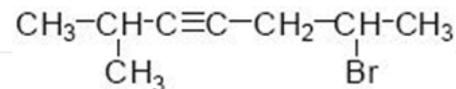
**acetileno**



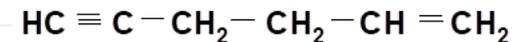
**2-butino**



**6-bromo-2-metil-3-heptino**



**1-hexen-5-ino**



# HIDROCARBUROS ALIFÁTICOS CÍCLICOS

01



CICLOALCANOS



02



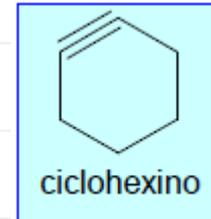
CICLOALQUENOS



03

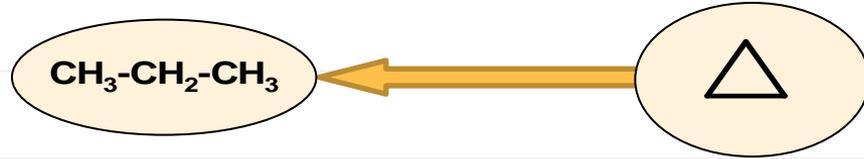


CICLOALQUINOS

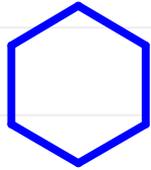


1.1. Se antepone el prefijo **ciclo-** al nombre del alcano de igual número de carbonos

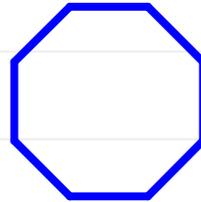
## Cicloalcano



Propano  **Ciclopropano**

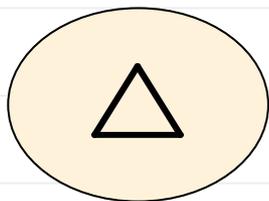


**Ciclohexano**

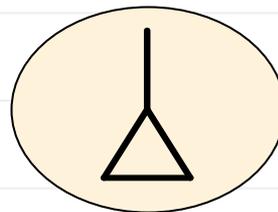


**Ciclooctano**

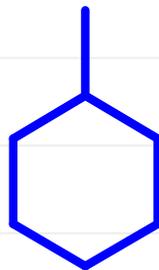
## 1.2. Los radicales se nombran cambiando **-ano** por **-ilo**



**Ciclopropa**no****

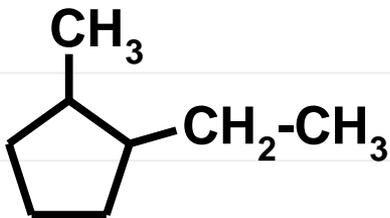


**Ciclopropa**ilo****

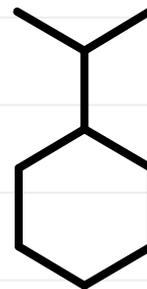


**Ciclohexi**lo****

**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

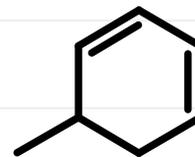


Isopropilciclohexano

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



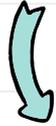
3-Metilciclohexeno



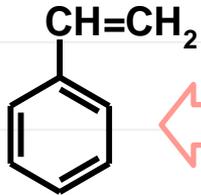
5-Metil-1,3-ciclohexadieno

# HIDROCARBUROS AROMÁTICOS

Nombre: localizadores + sustituyentes + benceno



MONOSUSTITUÍDOS

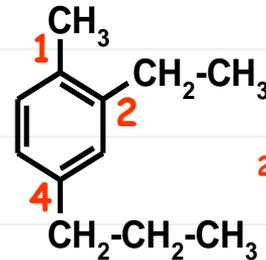


No necesita localizador  
6 carbonos equivalentes



POLISUSTITUÍDOS

Numeración: Se dan los nº más bajos a los sustituyentes



2-Etil-1-metil-4-propilbenceno

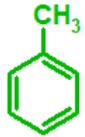
# NOMBRES PROPIOS Y SUS RADICALES

Ar-

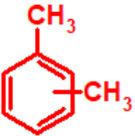
## BENCENO Y SUS DERIVADOS



BENCENO



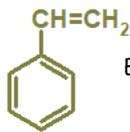
TOLUENO



o-XILENO  
m-XILENO  
p-XILENO

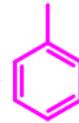


MESITILENO

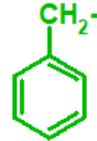


ESTIRENO

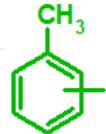
## RADICALES ARILO



FENILO  
(Ph-)



BENCILO



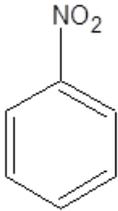
o-TOLILO  
m-TOLILO  
p-TOLILO

Disustituídos

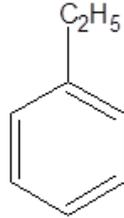
orto- → o- → 1,2-  
meta- → m- → 1,3-  
para- → p- → 1,4-

# EJEMPLOS

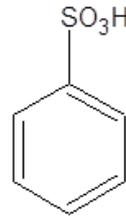
Nitrobenzeno



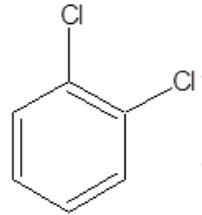
Etilbenzeno



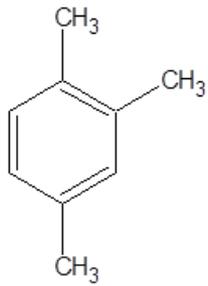
Ácido bencenosulfónico



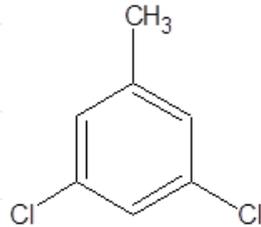
o-diclorobenceno



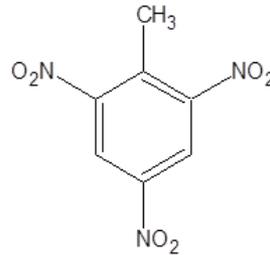
1,2,4-trimetilbenzeno



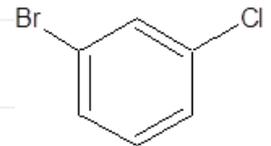
3,5-diclorotolueno



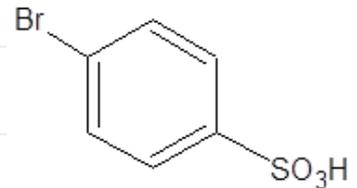
2,4,6-trinitrotolueno (TNT)

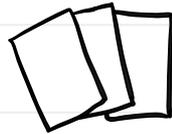


m-bromoclorobenceno



Ác. p-bromobenzenosulfónico

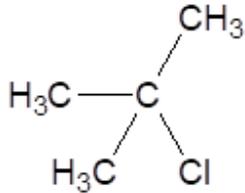




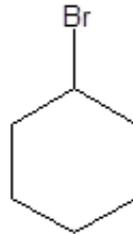
# HALOGENUROS DE ALQUILO Y ARILO

R-X

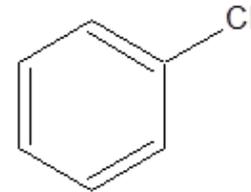
Ar-X



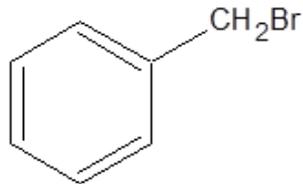
2-cloro-2-metilpropano  
Cloruro de t-butilo



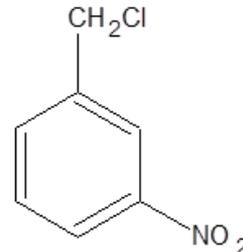
Bromociclohexano  
Bromuro de ciclohexilo



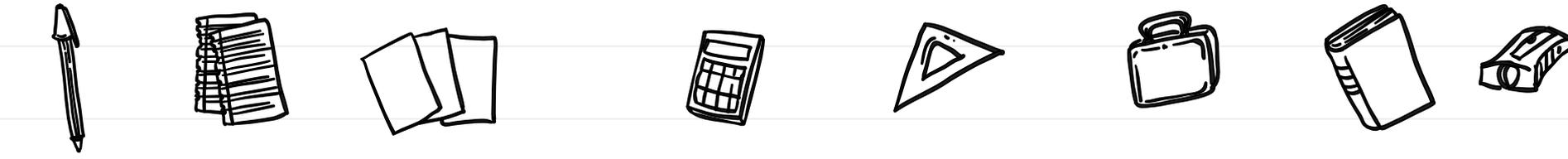
Clorobenceno



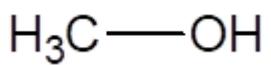
Bromuro de bencilo



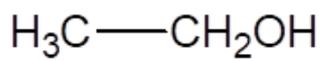
Cloruro de m-nitrobencilo



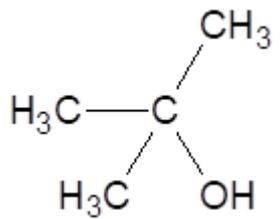
# ALCOHOLES



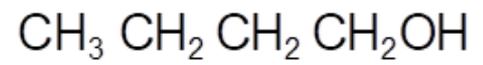
**Metanol**  
Alcohol metílico



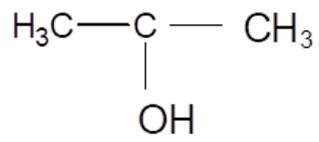
**Etanol**  
Alcohol etílico



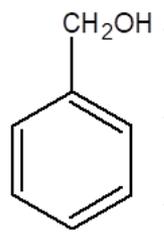
**2-metil-2-propanol**  
Alcohol t-butílico



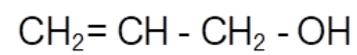
**1-butanol**  
Alcohol n-butílico



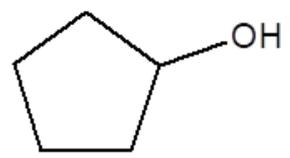
**2-propanol**  
Alcohol isopropílico



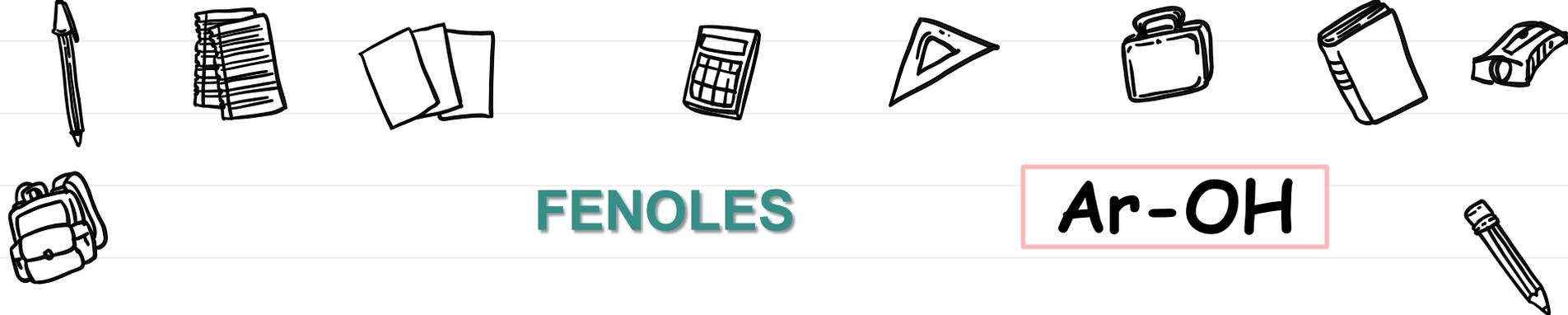
**Alcohol bencílico**



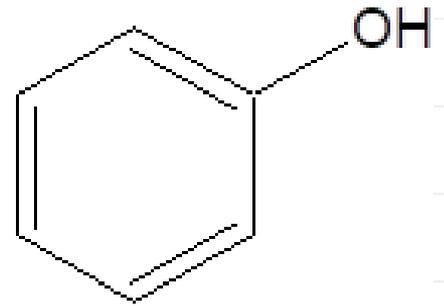
**2-propen-1-ol**



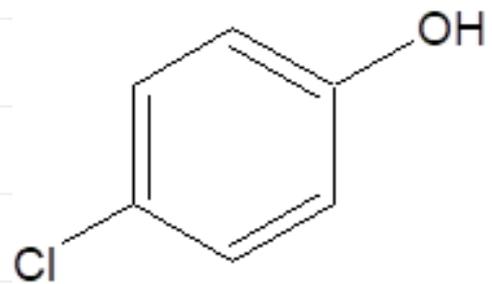
**Ciclopentanol**  
Alcohol ciclopentílico



# FENOLES



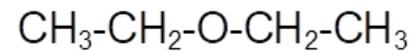
FENOL



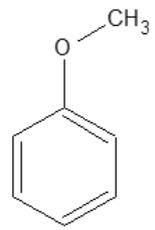
p-CLOROFENOL



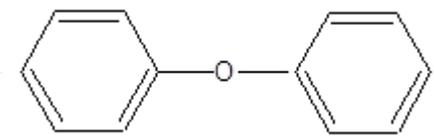
# ÉTERES



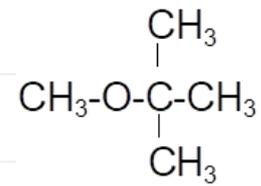
**Dietiléter**  
**Éter etílico**



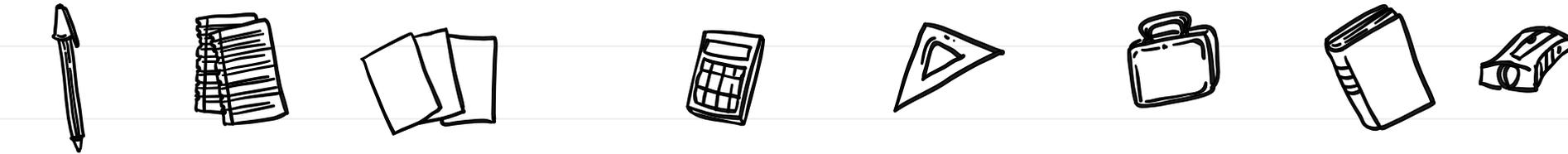
**Fenilmetiléter**  
**Anisol**



**Difeniléter**

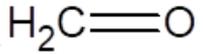


**t-butilmetiléter**

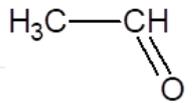


# ALDEHÍDOS Y CETONAS

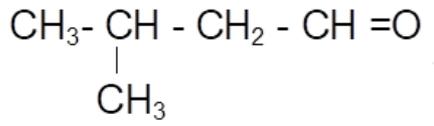
## R-CHO



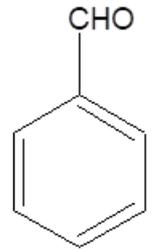
METANAL  
(Formaldehído)



ETANAL  
(Acetaldehído)

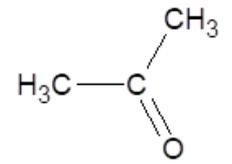


3-metilbutanal

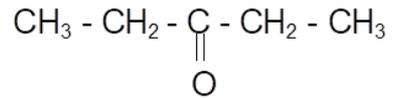


BENZALDEHÍDO

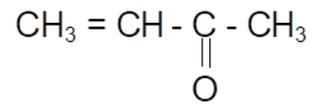
## R-CO-R



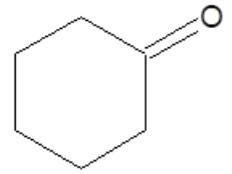
PROPANONA  
(Acetona)



3-pentanona



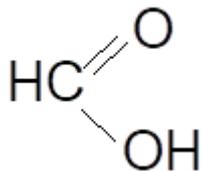
3-buten-2-ona



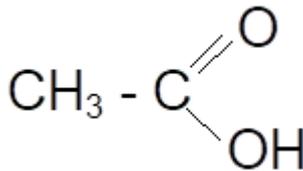
CICLOHEXANONA



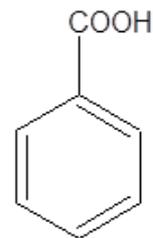
# ÁCIDOS CARBOXÍLICOS



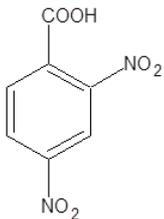
Ácido metanoico  
(Ácido fórmico)



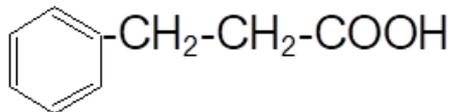
Ácido etanoico  
(Ácido Acético)



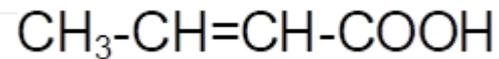
Ácido benzoico



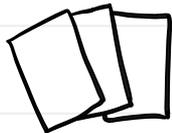
Ácido 2,4-dinitrobenzoico



Ácido 3-fenilpropanoico

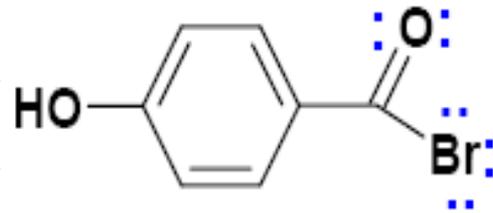
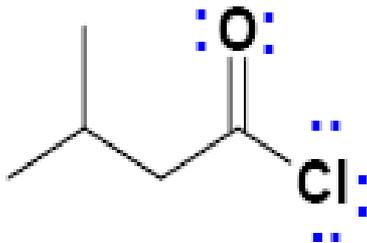
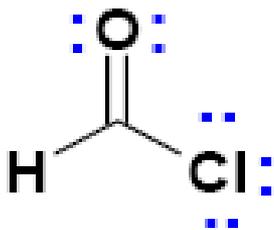


Ácido 2-butenico



## HALUROS DE ACILO

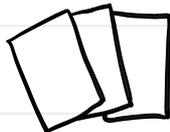
$R-COX'$



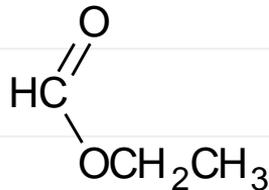
Cloruro de metanoilo  
(Cloruro de formilo)

Cloruro de 3-metilbutanoilo  
(Cloruro de isovaleroilo)

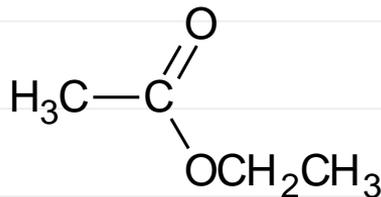
Bromuro de p-hidroxibenzoilo



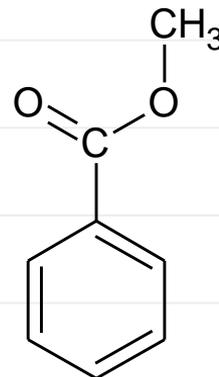
# ÉSTERES



Metanoato de etilo  
(Formiato de etilo)



Etanoato de etilo  
(Acetato de etilo)

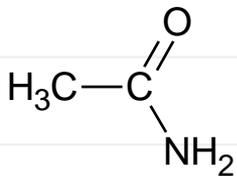


Benzoato de metilo



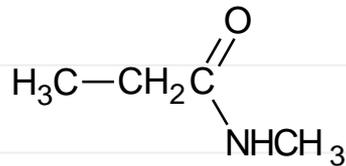
# AMIDAS

PRIMARIAS



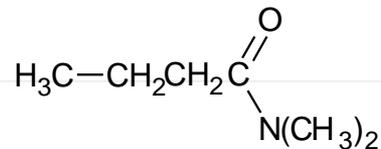
etanamida

SECUNDARIAS



N-metilpropanamida

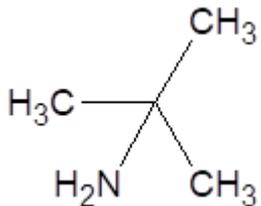
TERCIARIAS



N,N-dimetilbutanamida

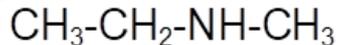
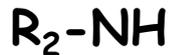
# AMINAS

PRIMARIAS



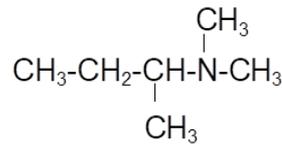
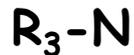
t-butilamina

SECUNDARIAS



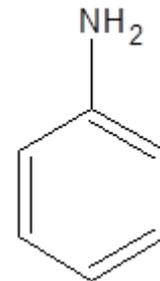
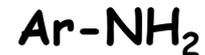
etilmetilamina

TERCIARIAS



sec-butildimetilamina

AROMÁTICAS



Anilina

# MUCHAS GRACIAS!

