Química

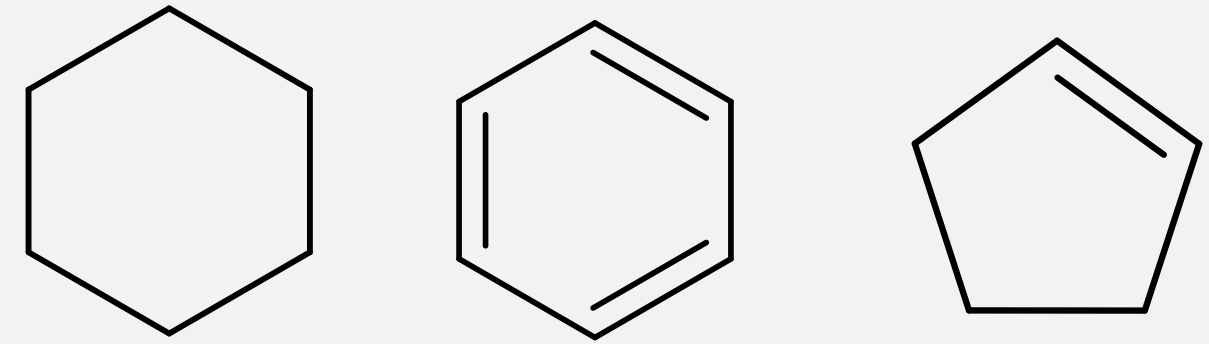
Química Orgânica

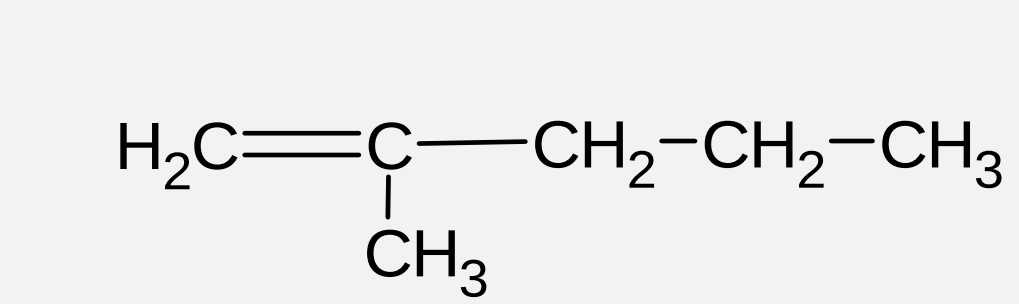
Hidrocarbonetos

Profª Angélica Brito

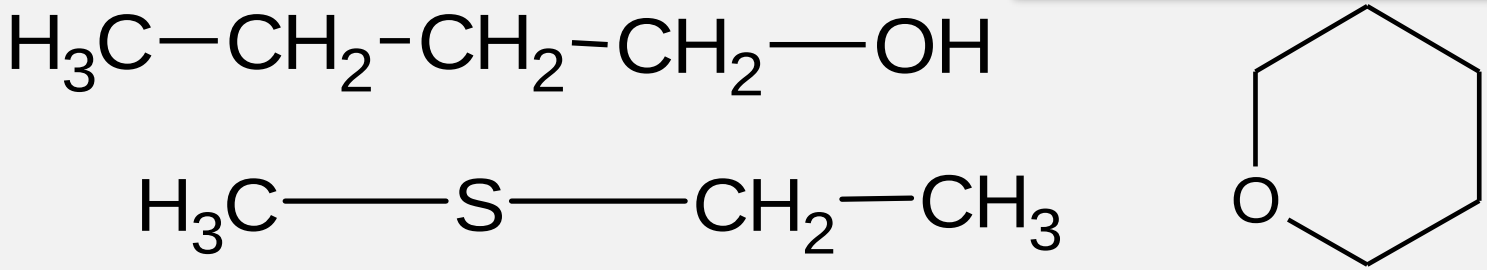
Hidrocarbonetos

Hidrocarbonetos! → Formados por átomos de carbono (C) e hidrogênio (H)

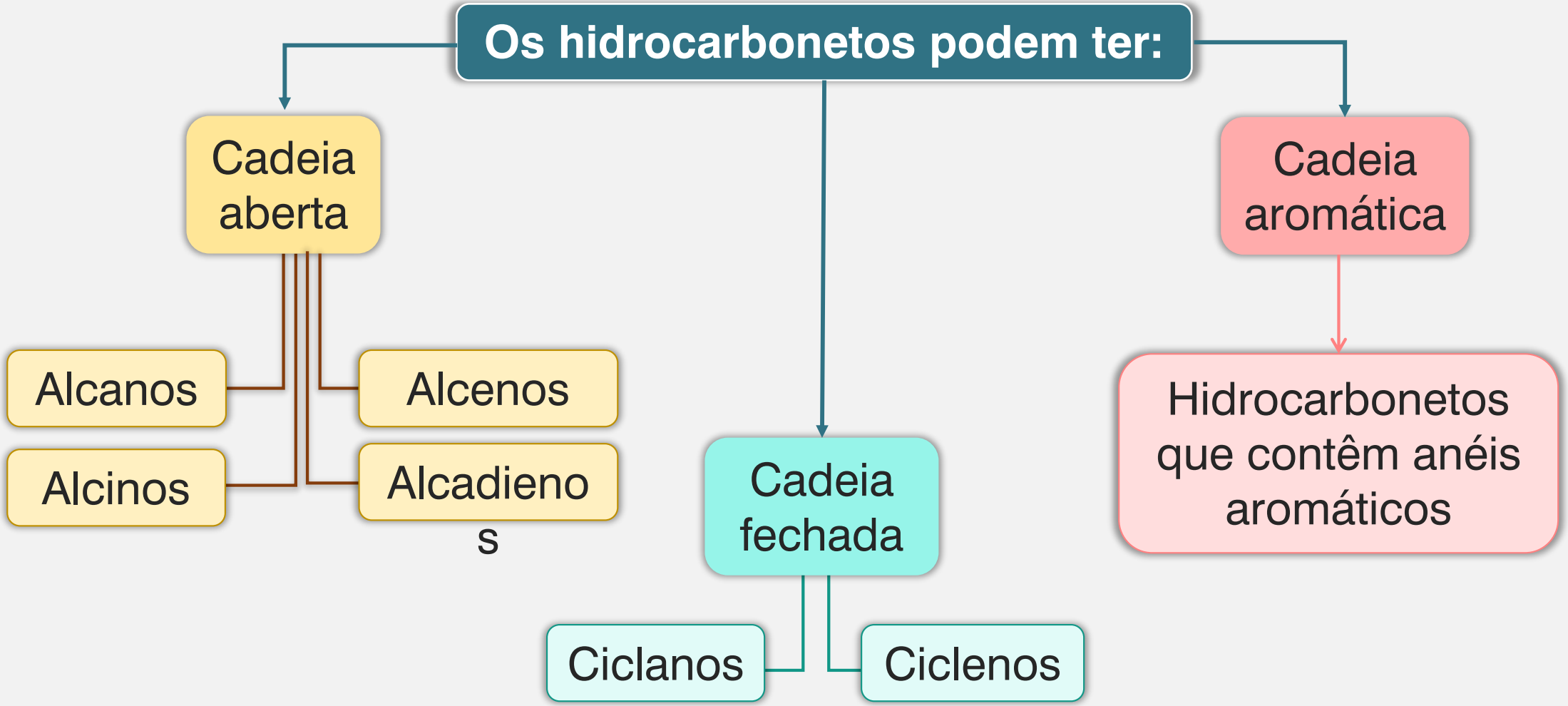




Não são hidrocarbonetos

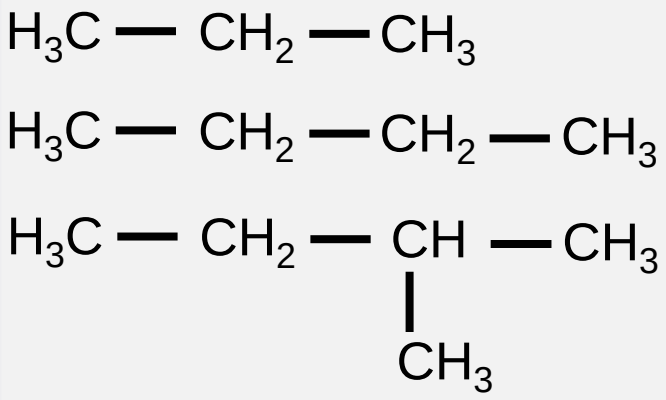


Hidrocarbonetos

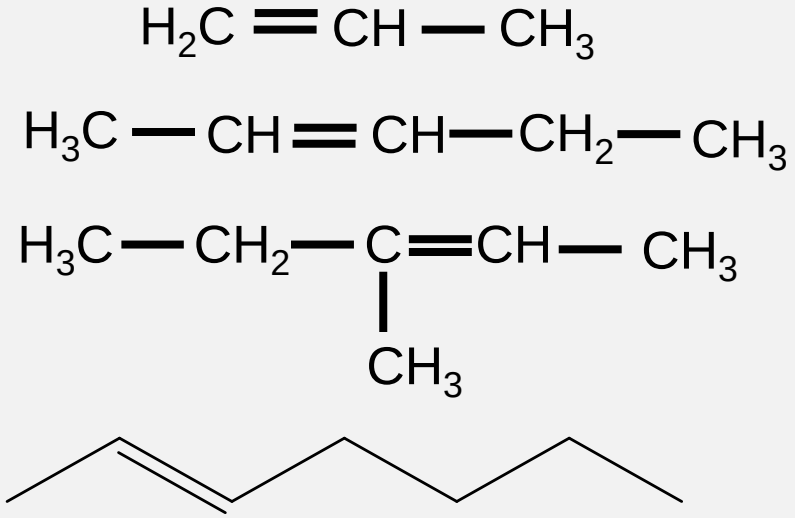


Hidrocarbonetos

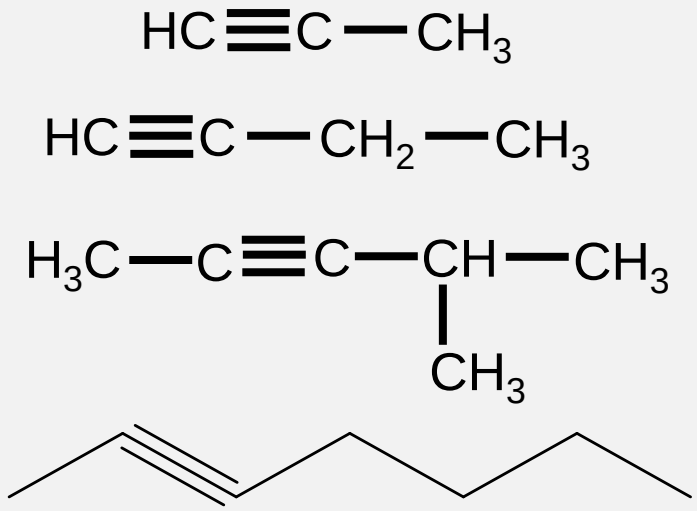
Alcanos



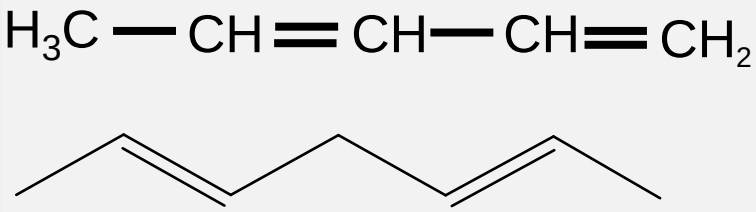
Alcenos



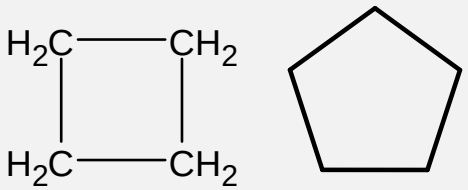
Alcinos



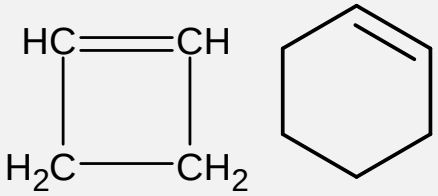
Alcadieno



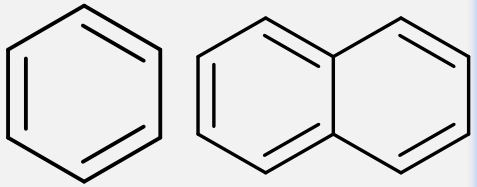
Ciclano



Cicleno

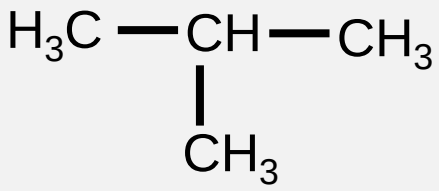


Aromático

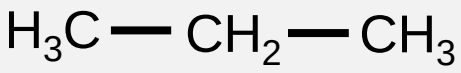


Hidrocarbonetos

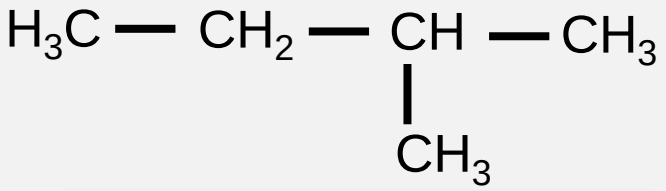
❑ Os alcanos são hidrocarbonetos de cadeia aberta e saturada;



Fórmula molecular
C_4H_{10}



Fórmula molecular
C_3H_8



Fórmula molecular
C_5H_{12}

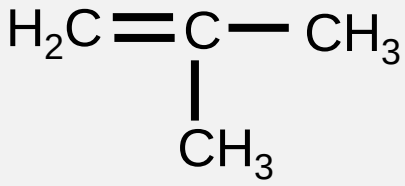
FÓRMULA GERAL

$$C_nH_{2n+2}$$

Número de carbonos da molécula

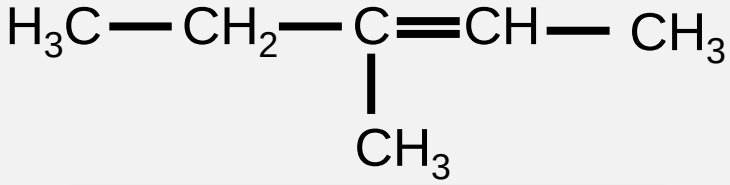
Hidrocarbonetos

❑ Os alcenos são hidrocarbonetos de cadeia aberta com uma ligação dupla;



Fórmula molecular
C_4H_8

Fórmula molecular
C_3H_6



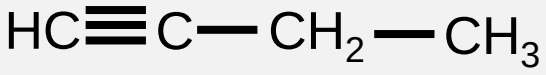
Fórmula molecular
C_6H_{12}

FÓRMULA GERAL

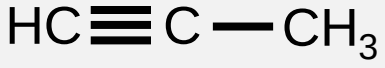
$\mathbf{C_nH_{2n}}$

Hidrocarbonetos

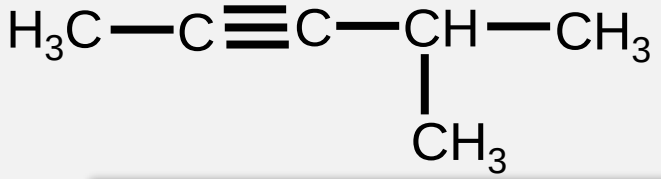
❑ Os alcinos são hidrocarbonetos de cadeia aberta com uma ligação tripla;



Fórmula molecular
C_4H_6



Fórmula molecular
C_3H_4



Fórmula molecular
C_6H_{10}

FÓRMULA GERAL

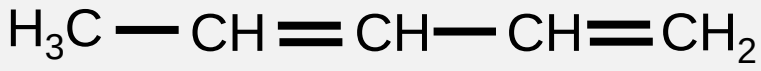
$\mathbf{C_nH_{2n-2}}$

Hidrocarbonetos

❑ Os alcadienos são hidrocarbonetos de cadeia aberta com duas ligações duplas;

Fórmula molecular
C_4H_6

Fórmula molecular
C_3H_4



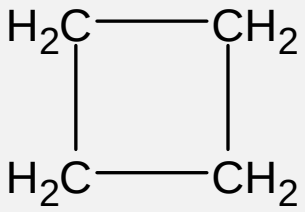
Fórmula molecular
C_5H_8

FÓRMULA GERAL

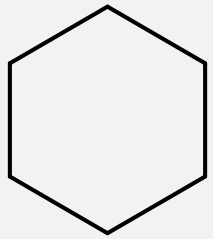
$\mathbf{C_nH_{2n-2}}$

Hidrocarbonetos

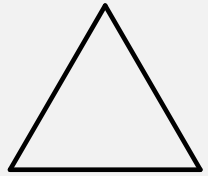
❑ Os ciclanos ou cicloalcanos são hidrocarbonetos de cadeia fechada e saturados;



Fórmula molecular
C_4H_8



Fórmula molecular
C_6H_{12}



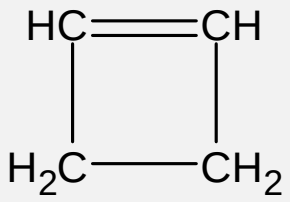
Fórmula molecular
C_3H_6

FÓRMULA GERAL

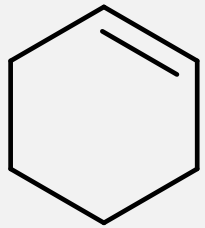
C_nH_{2n}

Hidrocarbonetos

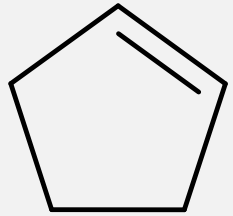
❑ Os ciclenos ou cicloalcenos são hidrocarbonetos de cadeia fechada e insaturados;



Fórmula molecular
C_4H_6



Fórmula molecular
C_6H_{10}



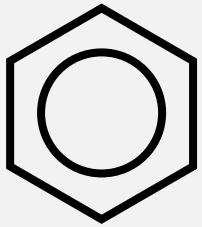
Fórmula molecular
C_5H_8

FÓRMULA GERAL

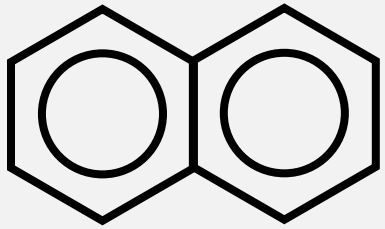
$\mathbf{C_nH_{2n-2}}$

Hidrocarbonetos

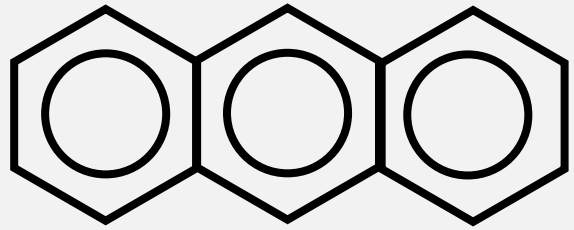
- Os aromáticos são hidrocarbonetos que possuem um ou mais grupos benzênicos;



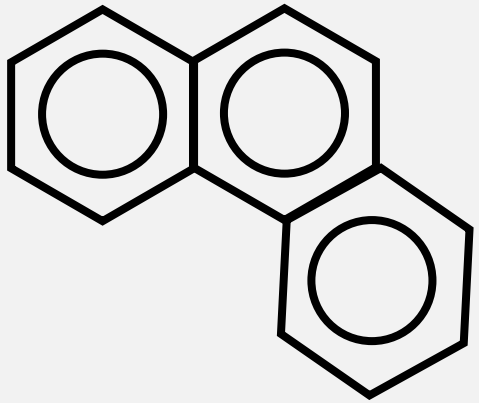
Benzeno



Naftaleno



Antraceno



Fenantreno

Nomenclatura de Hidrocarbonetos

Nomenclatura dos compostos orgânicos

↓

União Internacional de Química Pura e Aplicada

IUPAC

Prefixo + Infixo (intermediário) + Sufixo

O **infixo** indica o tipo de ligação

Infixo	Tipo de ligação
an	Simples
en	Dupla
in	Tripla

Nomenclatura de Hidrocarbonetos

O prefixo indica o número de carbonos na cadeia

Prefixo	Número de carbonos
Met	1
Et	2
Prop	3
But	4
Pent	5
Hex	6
Hept	7
Oct	8
Non	9
Dec	10

Nomenclatura de Hidrocarbonetos

O **sufixo** indica o tipo de função orgânica

Sufixo	Composto orgânico
o	Hidrocarboneto
ol	Álcool
al	Aldeído
ona	Cetona
oico	Ácido Carboxílico

Nomenclatura dos Alcanos

1 carbono

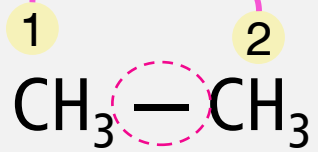
Prefixo = met

1 CH_4 **Metano**

*Terminação "**o**" porque é um hidrocarboneto.*

2 carbonos

Prefixo = Et

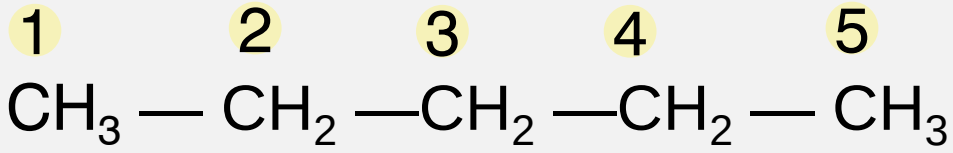


Etano

Ligação simples

Infixo = an

Prefixo = Pent



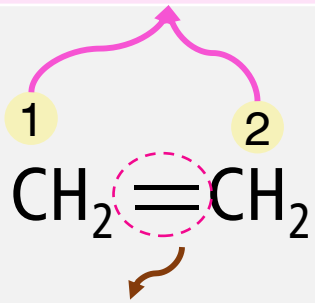
Infixo = an

Pentano

Nomenclatura dos Alcenos com até de 3 carbonos

2 carbonos

Prefixo = Et



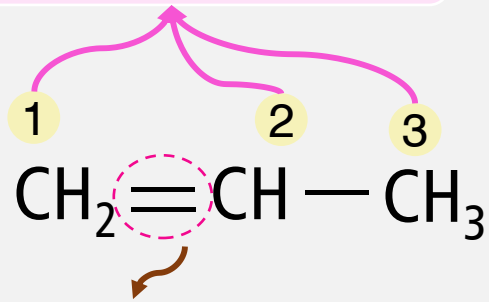
Eteno

Ligação dupla

Infixo = en

3 carbonos

Prefixo = Prop



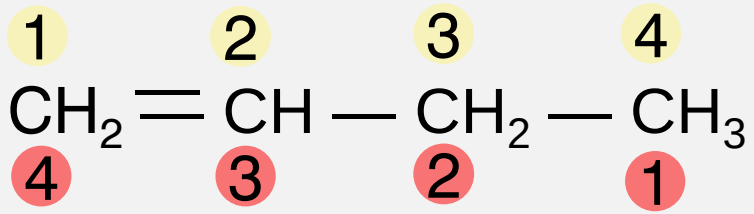
Ligação dupla

Infixo = en

Propeno

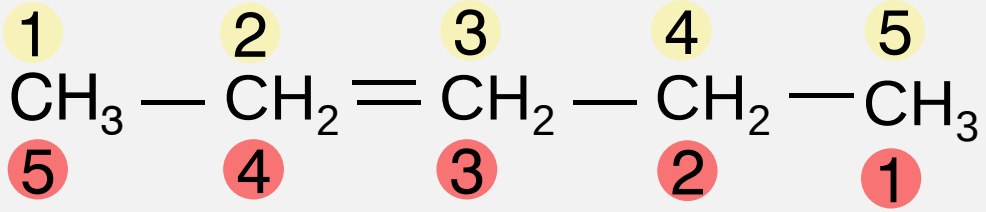
Nomenclatura dos Alcenos com mais de 3 carbonos

Indicar a posição da insaturação. ⟷ O carbono insaturado leva a menor numeração possível



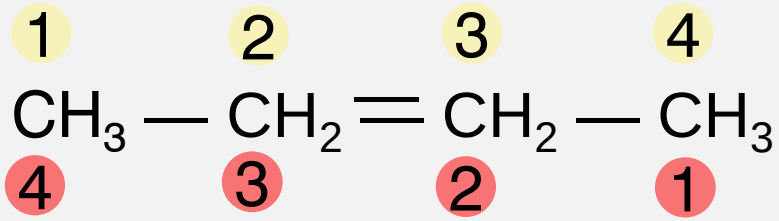
Infixo = en

But-1-eno



Infixo = en

Pent-2-eno



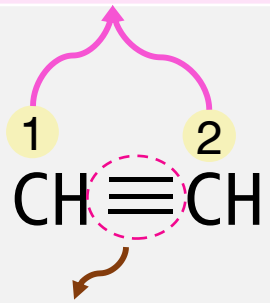
Infixo = en

But-2-eno

Nomenclatura dos Alcinos com até de 3 carbonos

2 carbonos

Prefixo = Et



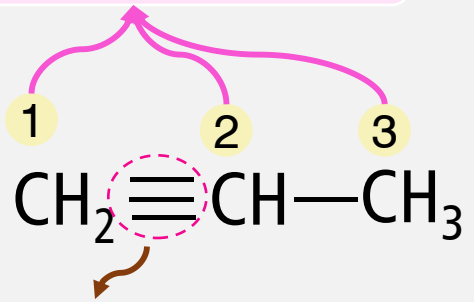
Etino

Ligação dupla

Infixo = in

3 carbonos

Prefixo = Prop



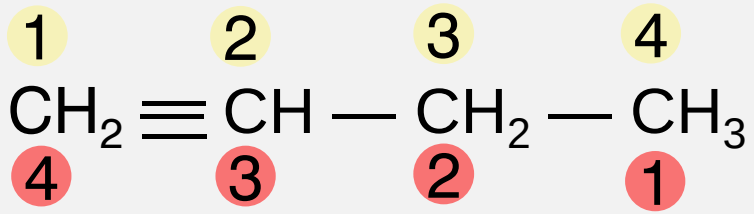
Ligação dupla

Propino

Infixo = in

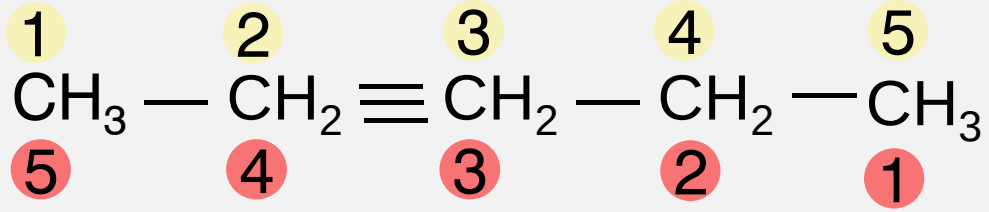
Nomenclatura dos Alcinos com mais de 3 carbonos

Indicar a posição da insaturação. ⟷ O carbono insaturado leva a menor numeração possível



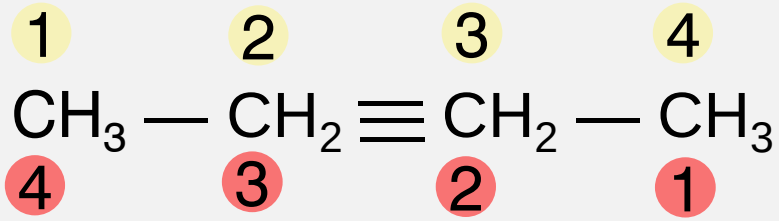
Infixo = in

But-1-ino



Infixo = en

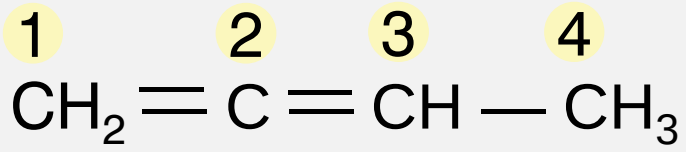
Pent-2-ino



Infixo = en

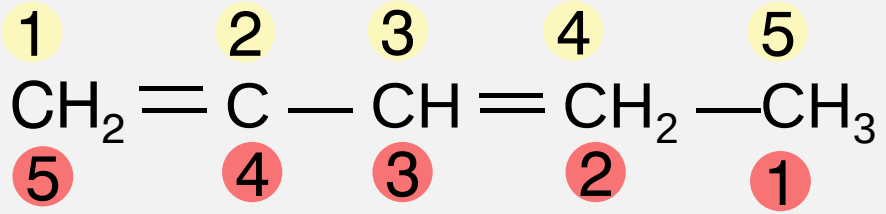
But-2-ino

Nomenclatura dos Alcadienos



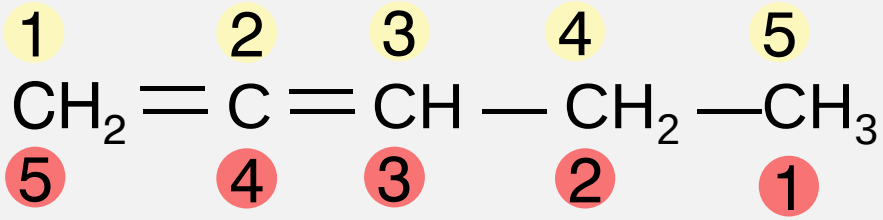
But-1,2-dieno

duas ligações



Pent-1,3-dieno

duas ligações

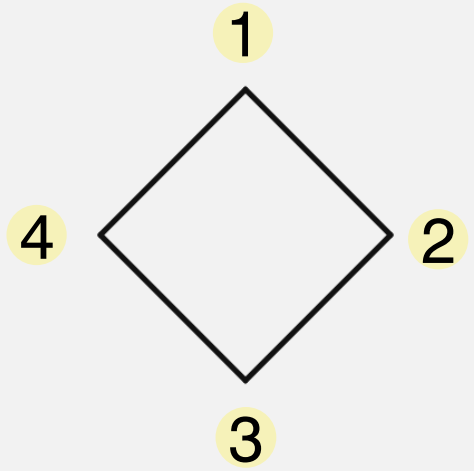


Pent-1,2-dieno

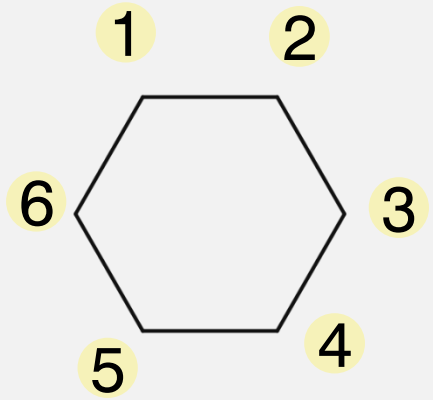
duas ligações

Ciclanos

Deve-se acrescentar o prefixo “ciclo” antes do nome.

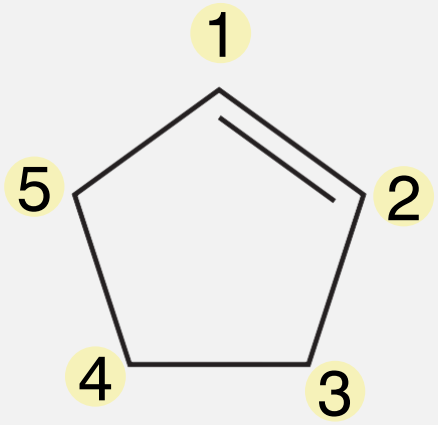


Ciclobutano



CicloHexano

Ciclenos

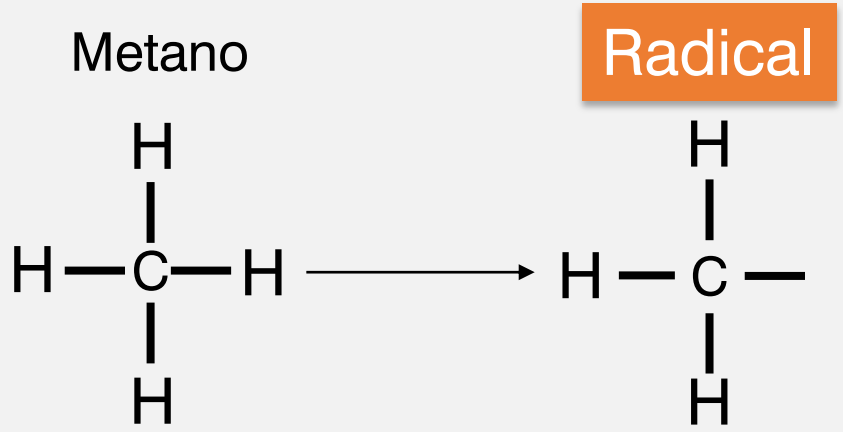


CicloPenteno

Hidrocarbonetos Ramificados

Devemos inicialmente conhecer o que vem a ser um grupo <u>Substituinte (Radical)</u>

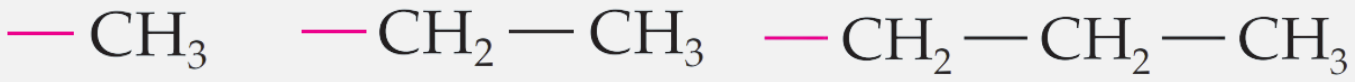
É qualquer grupo de átomos que apareça com frequência nas moléculas



Retirando um átomo de hidrogênio

Hidrocarbonetos Ramificados

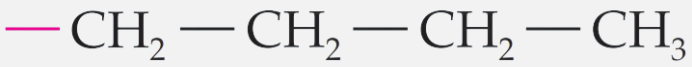
Para a nomenclatura das ramificações a terminação ano é trocada por il ou ila



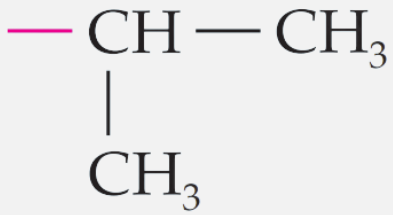
Metil

etil

Propil



butil

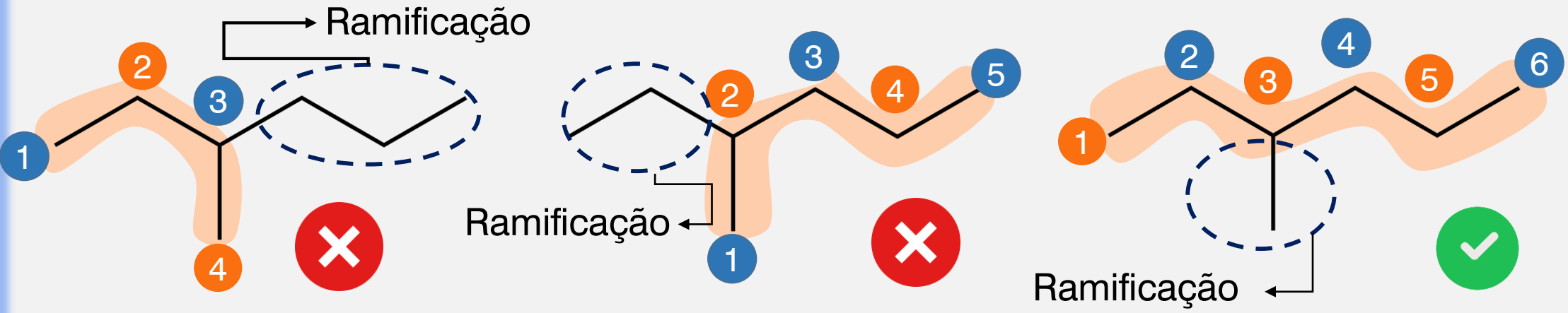


isopropil

Hidrocarbonetos ramificados

1 Nomear a cadeia principal

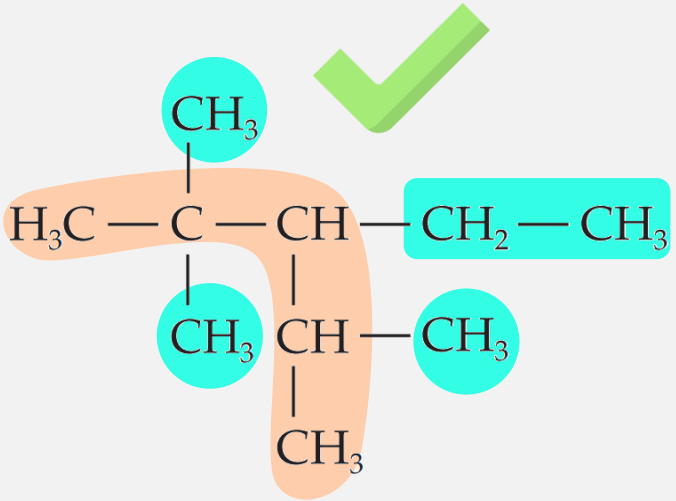
Cadeia com maior número de carbonos sequenciais



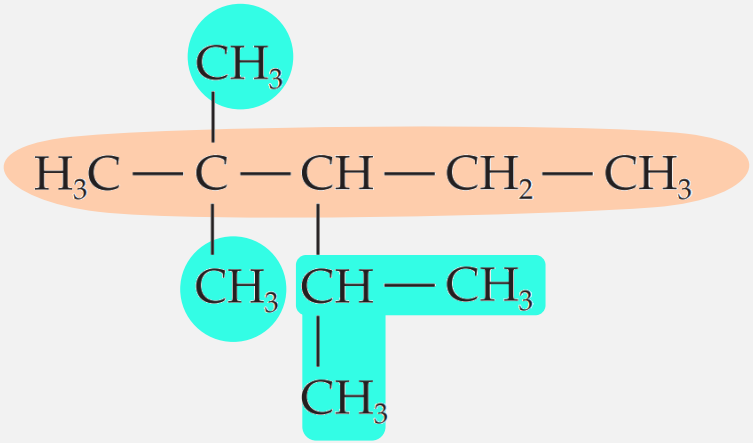
Hidrocarbonetos ramificados

No caso de duas sequências com iguais números de carbonos

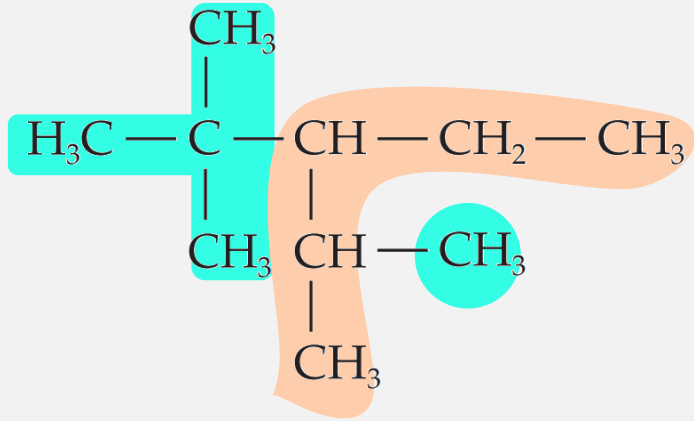
a cadeia principal é a mais ramificada



4 ramificações



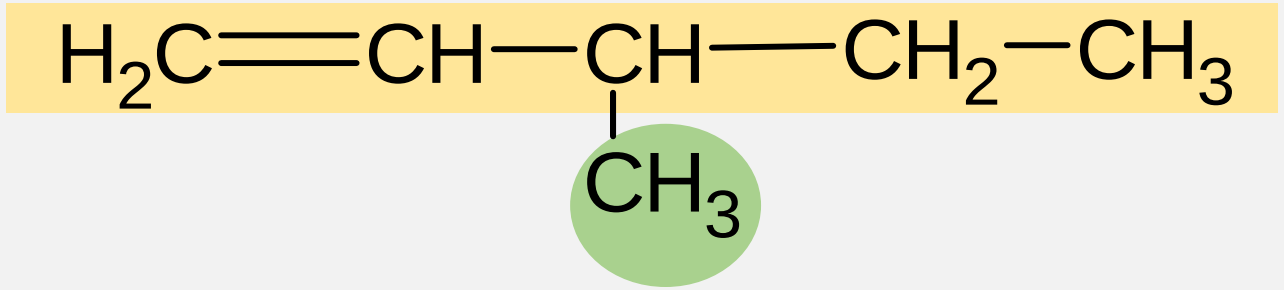
3 ramificações



2 ramificações

Hidrocarbonetos ramificados

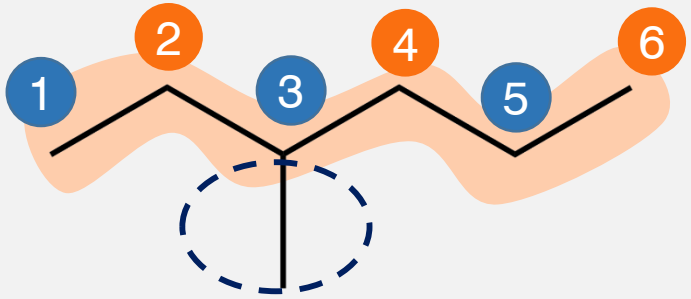
A cadeia principal é a sequência de átomos de carbono que possua o maior número de insaturações, de ramificações e maior quantidade de átomos de carbono;



Os grupos que não pertencem à cadeia principal são grupos substituintes (Radicais);

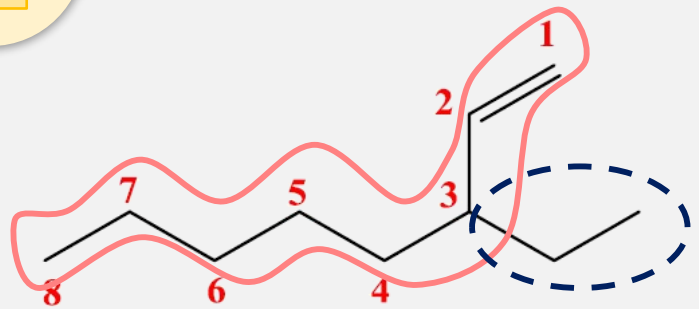
Numeração da cadeia principal

1 Se a cadeia for saturada



ramificação → menor número possível

2 Se a cadeia for instaurada



Instauração → menor número possível

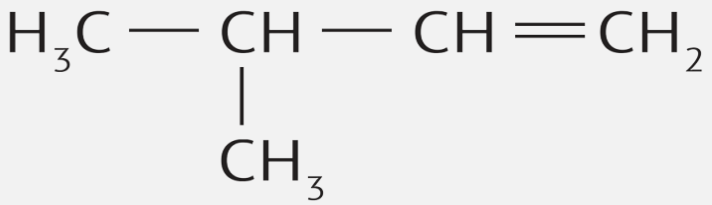
insaturação > ramificação

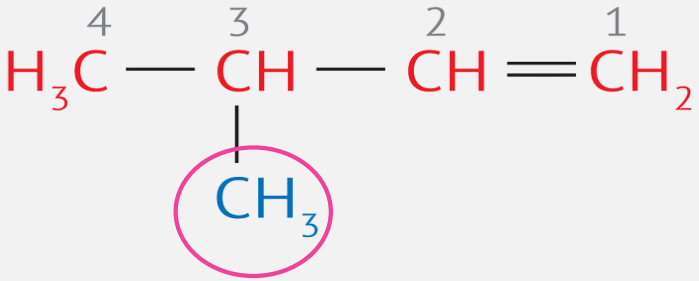
Regras para hidrocarbonetos Ramificados

1. Identificar a cadeia principal
2. Identificar os substituintes
3. O nome do substituinte vem antes
4. As insaturações são indicadas por n° antes do infixo.

Terminação “o”

Exemplos:

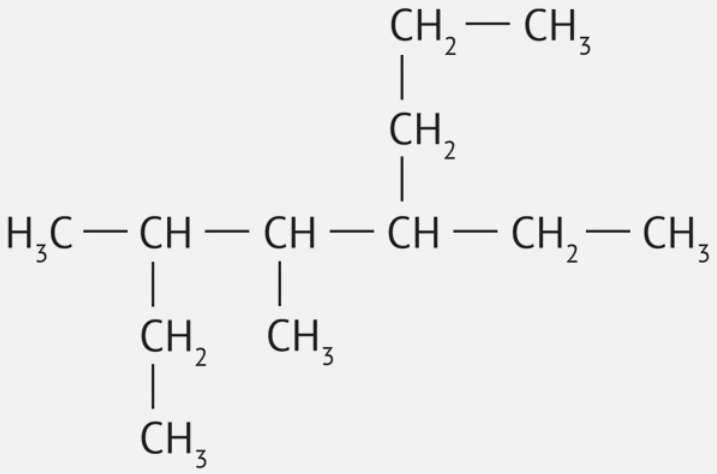


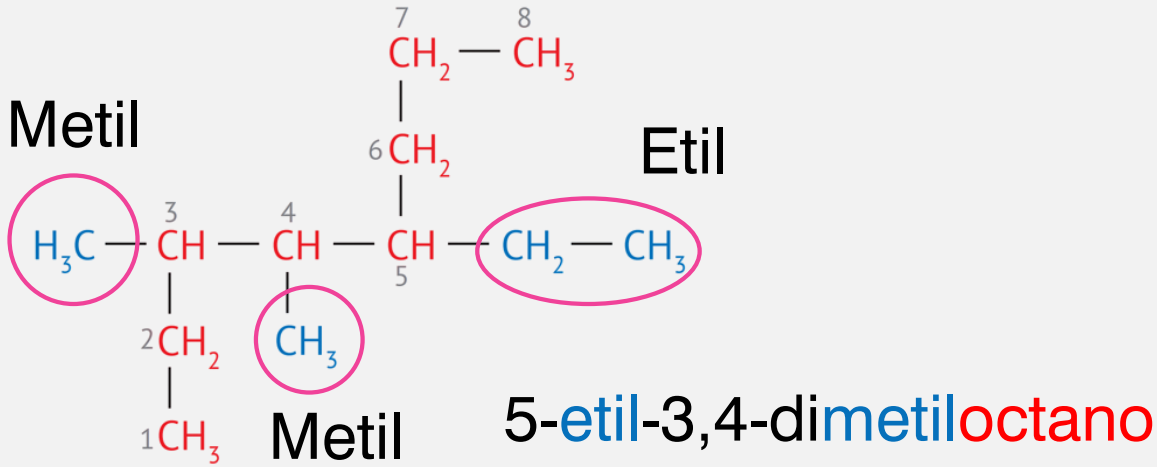


3-metilbut-1-eno

Regras para hidrocarbonetos Ramificados

Exemplos:

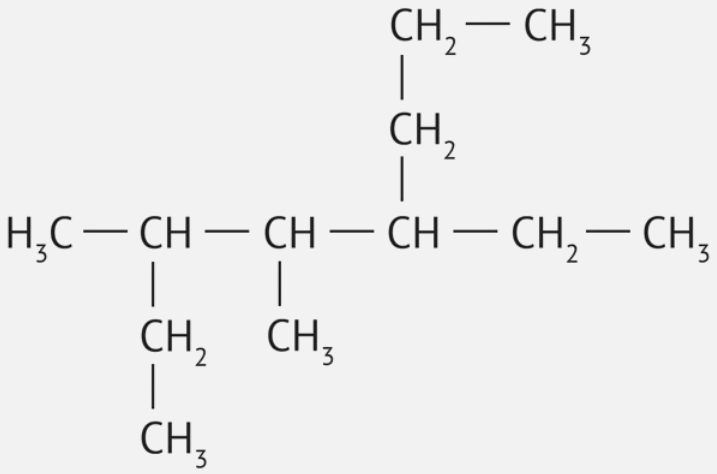


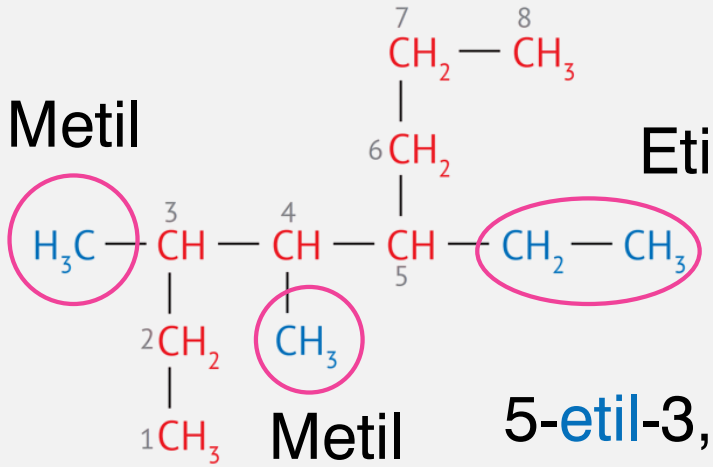


5-etil-3,4-dimetiloctano

Regras para hidrocarbonetos Ramificados

Exemplos:





5-etil-3,4-dimetiloctano