

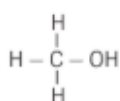


EXERCÍCIOS DE QUÍMICA ORGÂNICA – 3ª SÉRIE

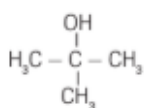
[**Conteúdo:** álcoois, fenol, enol, éter, cetona, aldeído e ácidos carboxílicos]

1) (UERJ) Um acidente com um trem, em junho de 2003, acarretou o despejo do metanol e 2-metilpropan-2-ol no rio que abastece a cidade de Uberaba. As fórmulas estruturais dos compostos mencionados estão representadas, respectivamente, em:

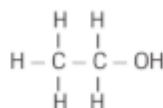
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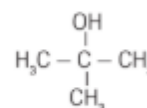
e



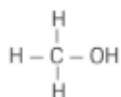
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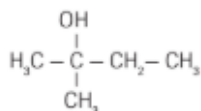
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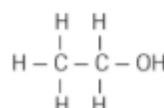
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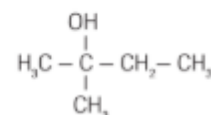
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d)

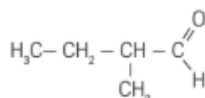


e

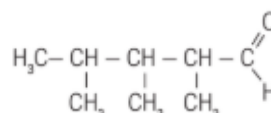


2) Escreva o nome dos seguintes aldeídos:

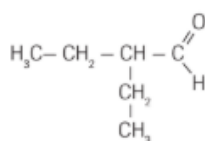
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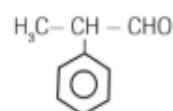
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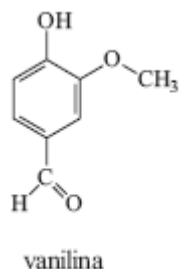
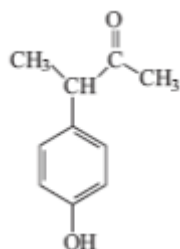
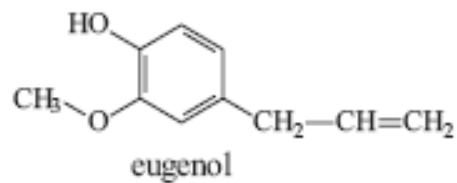
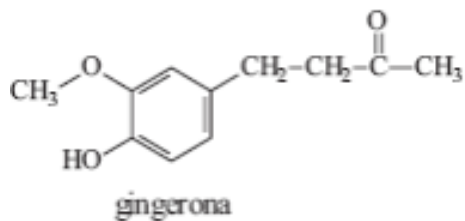
b)



d)

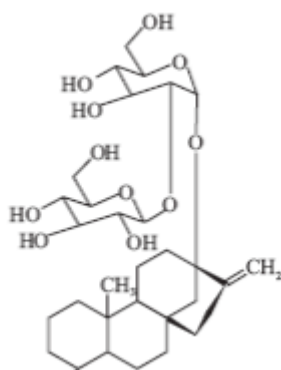


3) Os aromas e sabores dos alimentos são essenciais para nossa cultura na escolha, no preparo e na degustação dos alimentos. A seguir estão representadas algumas das substâncias responsáveis pelas sensações características do gengibre, da framboesa, do cravo e da baunilha.



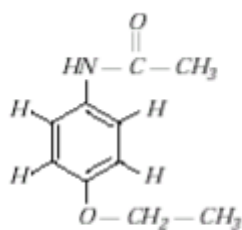
Quais as funções químicas em comum presentes nas estruturas representadas acima?

4) Analise a estrutura abaixo. Quais as funções orgânicas presentes na estrutura?

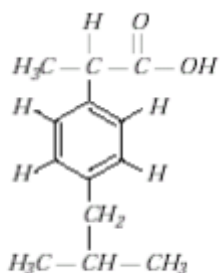


- a) Álcool e cetona.
- b) Álcool e éter.
- c) Álcool e éster.
- d) Éster e cetona.
- e) Éter e cetona.

5) São dadas as fórmulas estruturais de dois medicamentos



fenacetina (X)

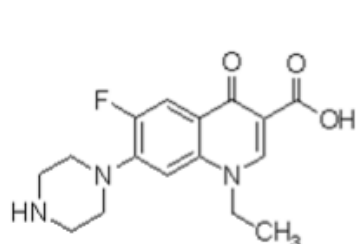


ibuprofen (Y)

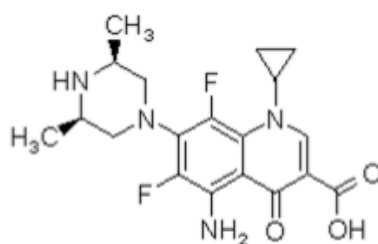
Julgue os itens:

- I. X possui as funções éter e aldeído.
- II. Y é um ácido carboxílico.
- III. Ambas estruturas são aromáticas.
- IV. A estrutura X possui uma carbonila e um heteroátomo.
- V. A estrutura Y há uma carboxila.

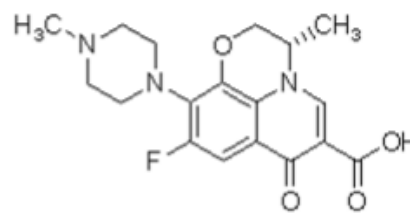
6) **Fluorquinolonas constituem uma classe de antibióticos capazes de combater diferentes tipos de bactérias. A norfloxacina, a esparfloxacina e a levofloxacina são alguns dos membros da família das fluorquinolonas.**



norfloxacina



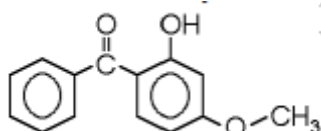
esparfloxacina



levofloxacina

Das funções orgânicas estudadas até o momento, quais são identificadas nas estruturas acima?

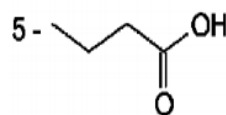
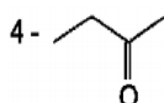
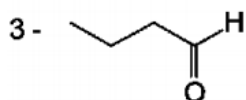
7) **A exposição excessiva ao sol pode trazer sérios danos à pele humana. Para atenuar tais efeitos nocivos, costuma-se utilizar agentes protetores solares, dentre os quais pode-se citar o 2-hidróxi-4-metóxi-benzofenona, cuja fórmula está representada a seguir:**



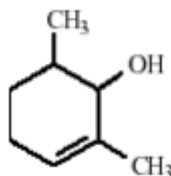
Sobre esta substância é correto afirmar que

- a) apresenta fórmula molecular $C_{10}H_4O_3$ e é um hidrocarboneto aromático.
- b) apresenta fórmula molecular $C_{10}H_4O_5$ e função mista: álcool, éter e cetona.
- c) apresenta fórmula molecular $C_{14}H_{12}O_5$ e caráter básico pronunciado pela presença do grupo -OH.
- d) apresenta fórmula molecular $C_{14}H_{12}O_3$ e é um composto aromático de função mista: cetona, fenol e éter.
- e) apresenta fórmula molecular $C_{14}H_{16}O_3$, é totalmente apolar e insolúvel em água.

- 8) O vinho, o vinagre, a acetona e o éter etílico são apenas alguns exemplos de compostos orgânicos que estão presentes no nosso cotidiano. Observe as estruturas dos compostos representadas a seguir e indique as funções às quais elas pertencem e suas nomenclaturas.

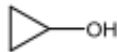
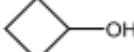

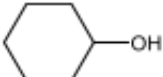
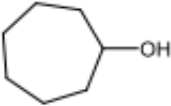
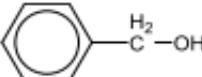


- 9) De acordo com as regras oficiais de nomenclatura (IUPAC), o nome da substância, cuja fórmula estrutural simplificada é mostrada abaixo, é:



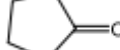
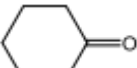
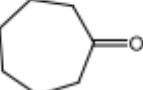
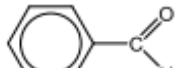


- a) 1,3-dimetilciclo-hex-3-en-2-ol
- b) 2,4-dimetilciclo-hex-1-en-3-ol
- c) 1,3-dimetilciclo-hex-1-en-2-ol
- d) 2,6-dimetilciclo-hex-2-en-1-ol

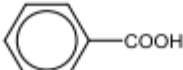

10) Dê o nome dos compostos orgânicos abaixo.

$\text{H}_3\text{C}-\text{OH}$	$\text{H}_3\text{C}-\overset{\text{H}_2}{\text{C}}-\text{OH}$	$\text{H}_3\text{C}-\overset{\text{H}_2}{\text{C}}-\overset{\text{H}_2}{\text{C}}-\text{OH}$
$\text{H}_3\text{C}-\overset{\text{OH}}{\underset{\text{H}}{\text{C}}}-\text{CH}_3$	$\text{H}_3\text{C}-\overset{\text{H}_2}{\text{C}}-\overset{\text{H}_2}{\text{C}}-\overset{\text{H}_2}{\text{C}}-\text{OH}$	$\text{H}_3\text{C}-\overset{\text{H}_2}{\text{C}}-\overset{\text{OH}}{\underset{\text{H}}{\text{C}}}-\text{CH}_3$
$\text{H}_3\text{C}-\overset{\text{H}_2}{\text{C}}-\overset{\text{H}_2}{\text{C}}-\overset{\text{H}_2}{\text{C}}-\overset{\text{OH}}{\text{CH}_2}$	$\text{H}_3\text{C}-\overset{\text{H}_2}{\text{C}}-\overset{\text{H}_2}{\text{C}}-\overset{\text{OH}}{\underset{\text{H}}{\text{C}}}-\text{CH}_3$	$\text{H}_3\text{C}-\overset{\text{H}_2}{\text{C}}-\overset{\text{OH}}{\underset{\text{H}}{\text{C}}}-\overset{\text{H}_2}{\text{C}}-\text{CH}_3$
$\text{HO}-\overset{\text{H}_2}{\text{C}}-\overset{\text{H}_2}{\text{C}}-\text{OH}$	$\overset{\text{OH}}{\text{H}_2\text{C}}-\overset{\text{OH}}{\underset{\text{H}}{\text{C}}}-\overset{\text{OH}}{\text{CH}_2}$	$\overset{\text{OH}}{\text{H}_2\text{C}}-\overset{\text{OH}}{\underset{\text{H}}{\text{C}}}-\text{CH}_3$
$\text{H}_3\text{C}-\overset{\text{OH}}{\underset{\text{CH}_3}{\text{C}}}-\text{CH}_3$	$\text{H}_3\text{C}-\overset{\text{CH}_3}{\underset{\text{H}}{\text{C}}}-\overset{\text{H}_2}{\text{C}}-\text{OH}$	$\text{H}_3\text{C}-\overset{\text{CH}_3}{\underset{\text{H}}{\text{C}}}-\overset{\text{H}_2}{\text{C}}-\overset{\text{H}_2}{\text{C}}-\text{OH}$
$\text{H}_2\text{C}=\overset{\text{H}_2}{\underset{\text{H}}{\text{C}}}-\text{C}-\text{OH}$	$\text{H}_3\text{C}-\overset{\text{H}_2}{\text{C}}=\overset{\text{H}_2}{\text{C}}-\text{C}-\text{OH}$	$\text{HC}\equiv\text{C}-\overset{\text{H}_2}{\text{C}}-\overset{\text{H}_2}{\text{C}}-\text{OH}$
$\text{H}_3\text{C}-\overset{\text{H}_2}{\text{C}}-\overset{\text{CH}_3}{\underset{\text{H}}{\text{C}}}-\overset{\text{H}_2}{\text{C}}-\text{OH}$	$\text{H}_3\text{C}-\overset{\text{H}_2}{\text{C}}-\overset{\text{OH}}{\underset{\text{H}}{\text{C}}}-\overset{\text{CH}_3}{\underset{\text{H}}{\text{C}}}-\text{CH}_3$	$\text{H}_3\text{C}-\overset{\text{CH}_3}{\underset{\text{H}}{\text{C}}}-\overset{\text{H}_2}{\text{C}}-\overset{\text{OH}}{\underset{\text{H}}{\text{C}}}-\text{CH}_3$
		
		

11) Dê o nome dos compostos abaixo.

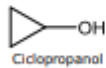
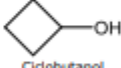

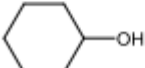
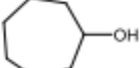
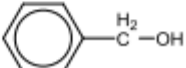
$\text{H}_3\text{C}-\text{C}(=\text{O})\text{H}$	$\text{H}_3\text{C}-\text{CH}_2-\text{C}(=\text{O})\text{H}$	$\text{H}_3\text{C}-\text{C}(=\text{O})-\text{CH}_3$
$\text{H}_3\text{C}-\text{CH}_2-\text{C}(=\text{O})-\text{CH}_3$	$\text{H}_3\text{C}-\text{CH}_2-\text{CH}_2-\text{CH}_2-\text{C}(=\text{O})\text{H}$	$\text{H}_2\text{C}=\text{CH}-\text{C}(=\text{O})-\text{CH}_3$
$\text{H}_3\text{C}-\text{CH}_2-\text{C}(=\text{O})-\text{CH}_2-\text{CH}_3$	$\text{H}_3\text{C}-\text{CH}_2-\text{CH}_2-\text{C}(=\text{O})-\text{CH}_3$	$\text{H}_3\text{C}-\text{CH}_2-\text{C}(=\text{O})-\text{CH}_2-\text{CH}_3$
$\text{H}_3\text{C}-\text{C}(=\text{O})-\text{CH}_2-\text{CH}_2-\text{CH}_3$	$\text{HC}\equiv\text{C}-\text{C}(=\text{O})-\text{CH}_3$	$\text{H}-\text{C}(=\text{O})-\text{CH}_2-\text{C}(=\text{O})-\text{H}$
$\text{H}_3\text{C}-\text{CH}(\text{CH}_3)-\text{C}(=\text{O})\text{H}$	$\text{H}_3\text{C}-\text{CH}(\text{CH}_3)-\text{CH}_2-\text{C}(=\text{O})\text{H}$	$\text{H}_3\text{C}-\text{C}(=\text{O})-\text{CH}_2-\text{CH}(\text{CH}_3)-\text{CH}_3$
$\text{H}_2\text{C}=\text{CH}-\text{CH}_2-\text{CHO}$	$\text{H}_3\text{C}-\text{CH}=\text{CH}-\text{CH}_2-\text{CHO}$	$\text{HC}\equiv\text{C}-\text{CH}_2-\text{CH}_2-\text{CHO}$
$\text{H}_3\text{C}-\text{CH}_2-\text{CH}(\text{CH}_3)-\text{CH}_2-\text{CHO}$	$\text{H}_3\text{C}-\text{CH}(\text{CH}_3)-\text{C}(=\text{O})-\text{CH}(\text{CH}_3)-\text{CH}_3$	$\text{H}_3\text{C}-\text{C}(\text{CH}_3)=\text{CH}-\text{CH}(\text{CH}_3)-\text{CHO}$
		
		

12) Dê o nome dos compostos abaixo.

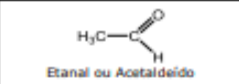
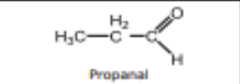
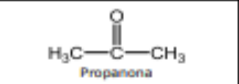
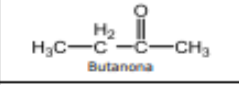
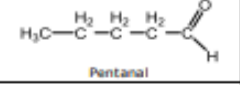
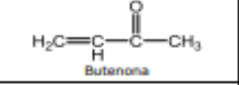
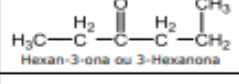
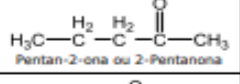
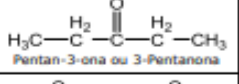
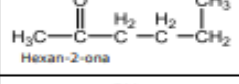
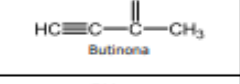
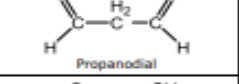
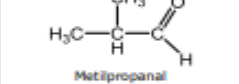
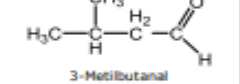
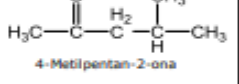
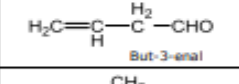
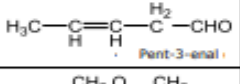
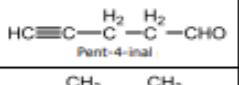
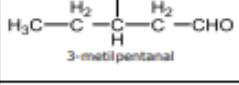
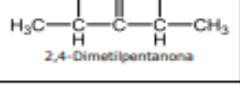
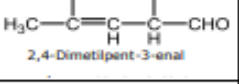

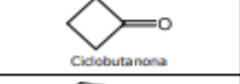
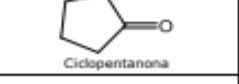
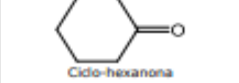
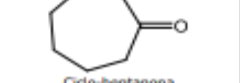

$\text{H}-\text{C}(=\text{O})\text{OH}$	$\text{H}_3\text{C}-\text{C}(=\text{O})\text{OH}$	$\text{H}_3\text{C}-\text{CH}_2-\text{C}(=\text{O})\text{OH}$
$\text{H}_3\text{C}-\text{CH}_2-\text{CH}_2-\text{C}(=\text{O})\text{OH}$	$\text{H}_3\text{C}-\text{CH}_2-\text{CH}_2-\text{CH}_2-\text{C}(=\text{O})\text{OH}$	$\text{H}_3\text{C}-\text{CH}(\text{CH}_3)-\text{C}(=\text{O})\text{OH}$
$\text{H}_2\text{C}=\text{CH}-\text{C}(=\text{O})\text{OH}$	$\text{H}_3\text{C}-\text{CH}=\text{CH}-\text{C}(=\text{O})\text{OH}$	$\text{H}_3\text{C}-\text{CH}(\text{CH}_3)-\text{CH}_2-\text{C}(=\text{O})\text{OH}$
$\text{H}_3\text{C}-\text{CH}_2-\text{CH}(\text{CH}_3)-\text{C}(=\text{O})\text{OH}$	$\text{HO}-\text{C}(=\text{O})-\text{CH}_2-\text{CH}_2-\text{C}(=\text{O})\text{OH}$	$\text{HO}-\text{C}(=\text{O})-\text{CH}_2-\text{C}(=\text{O})\text{OH}$
$\text{H}_3\text{C}-\text{CH}=\text{CH}-\text{CH}_2-\text{COOH}$	$\text{H}_2\text{C}=\text{CH}-\text{CH}=\text{CH}-\text{COOH}$	$\text{HC}\equiv\text{C}-\text{CH}_2-\text{CH}_2-\text{COOH}$
$\text{H}_3\text{C}-\text{CH}_2-\text{CH}(\text{CH}_3)-\text{CH}_2-\text{COOH}$		

GABARITO

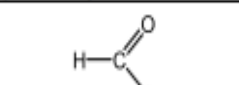
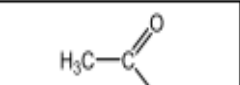
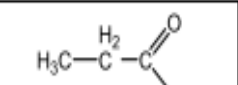
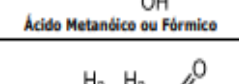
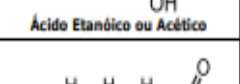
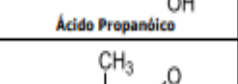
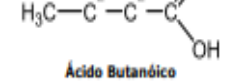
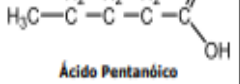
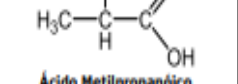
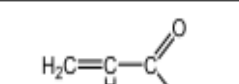
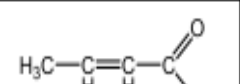
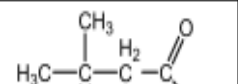
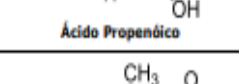
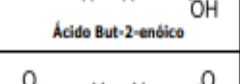
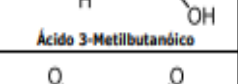
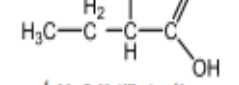
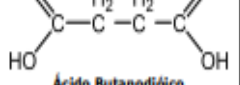
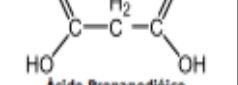
- 1) A
- 2) a) 2-metilbutanal; b) 2-etilbutanal; c) 2,3,4-trimetilpentanal; d) 2-fenilpropanal.
- 3) Éter e fenol.
- 4) B
- 5) F V V V V
- 6) Cetona, ácido carboxílico e éter.
- 7) D
- 8) 1. Éter, metóxi metano; 2. Álcool, butan-1-ol; 3. Aldeído, butanal; 4. Cetona, butan-2-ona; 5. Ácido carboxílico, ácido butanóico.
- 9) D
- 10)

$\begin{array}{c} \text{H}_3\text{C}-\text{OH} \\ \text{Metanol} \end{array}$	$\begin{array}{c} \text{H}_2 \\ \\ \text{H}_3\text{C}-\text{C}-\text{OH} \\ \text{Etanol} \end{array}$	$\begin{array}{c} \text{H}_2 \quad \text{H}_2 \\ \quad \\ \text{H}_3\text{C}-\text{C}-\text{C}-\text{OH} \\ \text{Propan-1-ol} \end{array}$
$\begin{array}{c} \text{OH} \\ \\ \text{H}_3\text{C}-\text{C}-\text{CH}_3 \\ \\ \text{H} \\ \text{Propan-2-ol} \end{array}$	$\begin{array}{c} \text{H}_2 \quad \text{H}_2 \quad \text{H}_2 \\ \quad \quad \\ \text{H}_3\text{C}-\text{C}-\text{C}-\text{C}-\text{OH} \\ \text{Butan-1-ol} \end{array}$	$\begin{array}{c} \text{OH} \\ \\ \text{H}_2 \quad \\ \quad \\ \text{H}_3\text{C}-\text{C}-\text{C}-\text{CH}_3 \\ \\ \text{H} \\ \text{Butan-2-ol} \end{array}$
$\begin{array}{c} \text{H}_2 \quad \text{H}_2 \quad \text{H}_2 \quad \text{OH} \\ \quad \quad \quad \\ \text{H}_3\text{C}-\text{C}-\text{C}-\text{C}-\text{CH}_2 \\ \text{pentan-1-ol} \end{array}$	$\begin{array}{c} \text{OH} \\ \\ \text{H}_2 \quad \quad \text{H}_2 \\ \quad \quad \\ \text{H}_3\text{C}-\text{C}-\text{C}-\text{C}-\text{CH}_3 \\ \text{pentan-2-ol} \end{array}$	$\begin{array}{c} \text{OH} \\ \\ \text{H}_2 \quad \quad \text{H}_2 \\ \quad \quad \\ \text{H}_3\text{C}-\text{C}-\text{C}-\text{C}-\text{CH}_3 \\ \text{pentan-3-ol} \end{array}$
$\begin{array}{c} \text{H}_2 \quad \text{H}_2 \\ \quad \\ \text{HO}-\text{C}-\text{C}-\text{OH} \\ \text{Etan-1,2-diol} \end{array}$	$\begin{array}{c} \text{OH} \quad \text{OH} \quad \text{OH} \\ \quad \quad \\ \text{H}_2\text{C}-\text{C}-\text{CH}_2 \\ \\ \text{H} \\ \text{propan-1,2,3-triol} \end{array}$	$\begin{array}{c} \text{OH} \quad \text{OH} \\ \quad \\ \text{H}_2\text{C}-\text{C}-\text{CH}_3 \\ \\ \text{H} \\ \text{Propan-1,2-diol} \end{array}$
$\begin{array}{c} \text{OH} \\ \\ \text{H}_3\text{C}-\text{C}-\text{CH}_3 \\ \\ \text{CH}_3 \\ \text{2-metilpropan-2-ol} \end{array}$	$\begin{array}{c} \text{CH}_3 \\ \\ \text{H}_3\text{C}-\text{C}-\text{H}_2-\text{OH} \\ \\ \text{H} \\ \text{2-metilpropan-1-ol} \end{array}$	$\begin{array}{c} \text{CH}_3 \\ \\ \text{H}_3\text{C}-\text{C}-\text{H}_2-\text{H}_2-\text{OH} \\ \\ \text{H} \\ \text{3-Metilbutan-1-ol} \end{array}$
$\begin{array}{c} \text{H}_2\text{C}=\text{C}=\text{H}_2-\text{OH} \\ \\ \text{H} \\ \text{Prop-2-en-1-ol} \end{array}$	$\begin{array}{c} \text{H}_2 \quad \text{H}_2 \\ \quad \\ \text{H}_3\text{C}-\text{C}=\text{C}-\text{C}-\text{OH} \\ \quad \\ \text{H} \quad \text{H} \\ \text{But-2-en-1-ol} \end{array}$	$\begin{array}{c} \text{H}_2 \quad \text{H}_2 \\ \quad \\ \text{HC}\equiv\text{C}-\text{C}-\text{C}-\text{OH} \\ \text{But-3-in-1-ol} \end{array}$
$\begin{array}{c} \text{CH}_3 \\ \\ \text{H}_3\text{C}-\text{C}-\text{H}_2-\text{H}_2-\text{OH} \\ \\ \text{H} \\ \text{2-Metilbutan-1-ol} \end{array}$	$\begin{array}{c} \text{OH} \quad \text{CH}_3 \\ \quad \\ \text{H}_3\text{C}-\text{C}-\text{C}-\text{CH}_3 \\ \quad \\ \text{H} \quad \text{H} \\ \text{2-metilpentan-3-ol} \end{array}$	$\begin{array}{c} \text{CH}_3 \quad \text{OH} \\ \quad \\ \text{H}_3\text{C}-\text{C}-\text{H}_2-\text{C}-\text{CH}_3 \\ \quad \\ \text{H} \quad \text{H} \\ \text{4-metilpentan-2-ol} \end{array}$
 Ciclopropanol	 Ciclobutanol	 Ciclopentanol
 Ciclo-hexanol	 Ciclo-heptanol	 Fenilmetanol ou Álcool Benzílico

11)

 Etanal ou Acetaldeído	 Propanal	 Propanona
 Butanona	 Pentanal	 Butenona
 Hexan-3-ona ou 3-Hexanona	 Pentan-2-ona ou 2-Pentanona	 Pentan-3-ona ou 3-Pentanona
 Hexan-2-ona	 Butinona	 Propanodial
 Metilpropanal	 3-Metilbutanal	 4-Metilpentan-2-ona
 But-3-enal	 Pent-3-enal	 Pent-4-inal
 3-metilpentanal	 2,4-Dimetilpentanona	 2,4-Dimetilpent-3-enal
 Ciclopropanona	 Ciclobutanona	 Ciclopentanona
 Ciclo-hexanona	 Ciclo-heptanona	 Benzenal ou Fenilmetanal

12)

 Ácido Metanóico ou Fórmico	 Ácido Etanóico ou Acético	 Ácido Propanóico
 Ácido Butanóico	 Ácido Pentanóico	 Ácido Metilpropanóico
 Ácido Propenóico	 Ácido But-2-enóico	 Ácido 3-Metilbutanóico
 Ácido 2-Metilbutanóico	 Ácido Butanodióico	 Ácido Propanodióico
 Ácido Pent-3-enóico	 Ácido Pent-2,4-dienóico	 Ácido Pent-4-inóico
 Ácido 3-Metilpentanóico	 Ácido Benzóico	 ácido benzeno-1,4-dióico