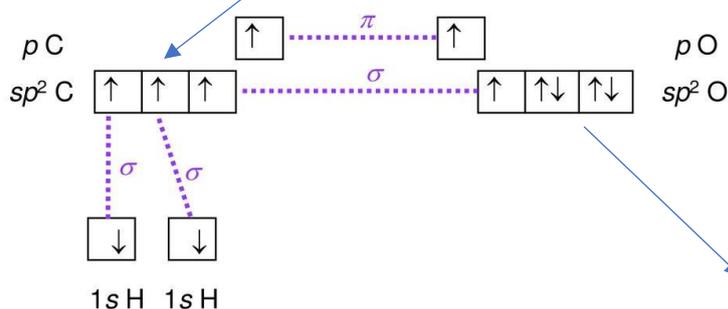
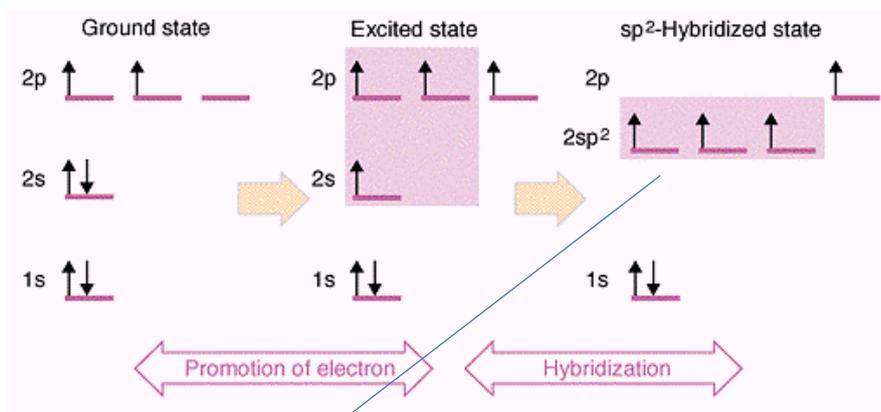


QFL1221 - Estrutura e Propriedades de Compostos Orgânicos (Noturno, 2020)
2ª Lista de exercícios

1) Proponha estruturas com seus correspondentes nomes para dois isômeros com a fórmula C_2H_7N .
Etilamina, *N,N*-dimetilamina (sempre que o nitrogênio tiver algum substituinte, deve-se especificá-los colocando *N* (sempre em itálico).

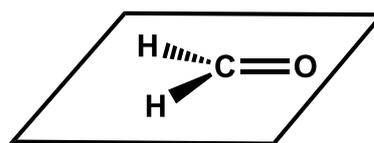
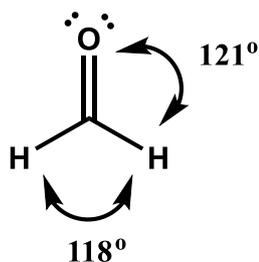
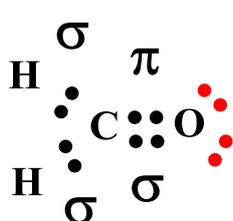
2) O formaldeído contém uma ligação dupla $C=O$. Represente a estrutura de Lewis e com linhas, indique a hibridização de cada átomo mostrando como os mesmos se combinam.



- O oxigênio hibridizado sp^2 possui

dois pares de elétrons não ligantes e seu elétron no orbital sp^2 faz uma ligação sigma com o carbono e o orbital p , faz a ligação π com o carbono.

- O carbono hibridizado sp^2 : forma 3 ligações sigma, duas com hidrogênios e uma com o oxigênio; o orbital $2p$ forma uma ligação π com o oxigênio.



estrutura trigonal planar

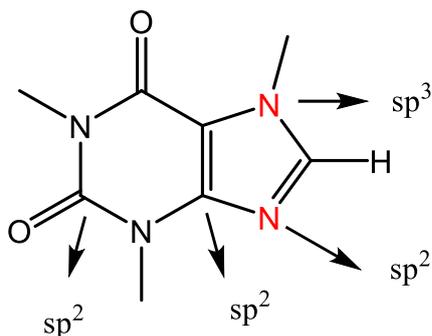
3) Qual a geometria esperada para os seguintes átomos nas moléculas?

a) Do átomo de oxigênio no metanol; sp^3 , tetraédrico torcido

b) Do átomo de nitrogênio na trimetilamina; pirâmide trigonal com um par de elétron não ligante;

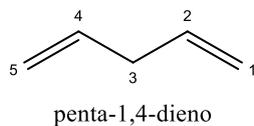
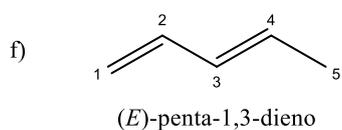
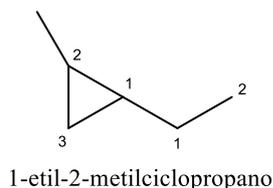
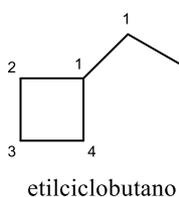
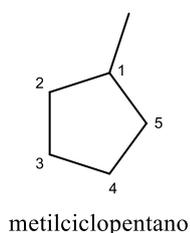
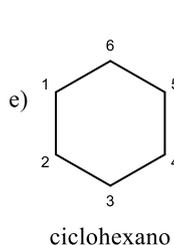
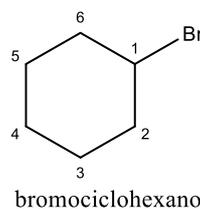
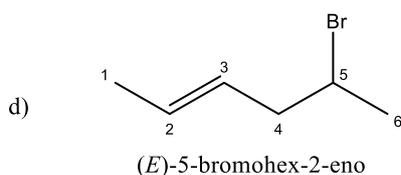
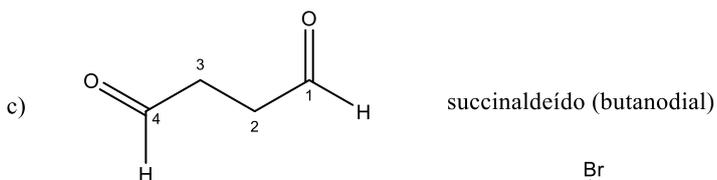
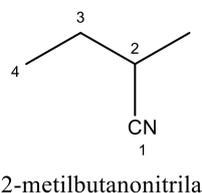
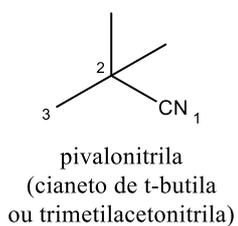
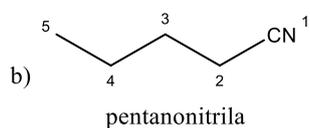
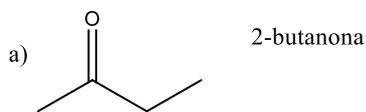
c) Do átomo de fosforo na fosfina ($:PH_3$): idem ao caso acima (pirâmide trigonal)

- 4) Complete a estrutura da cafeína mostrando os elétrons não ligantes que estão faltando. Qual a hibridização dos átomos indicados pelas setas?



- 5) Proponha estruturas e nomes para os seguintes compostos abaixo:

- a) uma cetona de fórmula C_4H_8O b) uma nitrila, C_5H_9N
 c) um dialdeído, $C_4H_6O_2$ d) um bromoalceno, $C_6H_{11}Br$

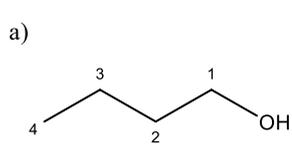


- 6) Represente compostos (dois exemplos) e forneça seus nomes IUPAC para:

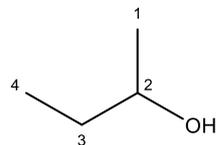
- a) álcoois de fórmula $C_4H_{10}O$ b) aminas de fórmula $C_5H_{13}N$
 c) cetonas de fórmula $C_5H_{10}O$ d) aldeídos de fórmula $C_5H_{10}O$

e) ésteres de fórmula $C_4H_8O_2$

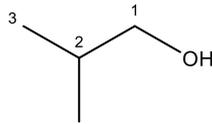
f) éteres de fórmula $C_4H_{10}O$



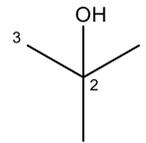
butan-1-ol (IUPAC)
n-butanol



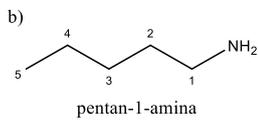
butan-2-ol
álcool sec-butílico



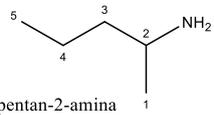
2-metilpropan-1-ol
álcool iso-butílico



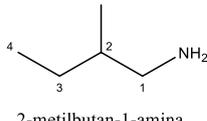
2-metilpropan-2-ol
álcool terc-butílico



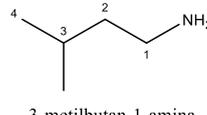
pentan-1-amina



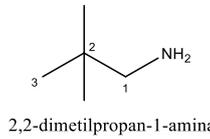
pentan-2-amina



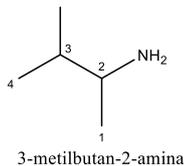
2-metilbutan-1-amina



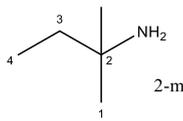
3-metilbutan-1-amina



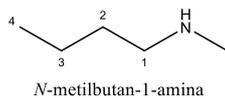
2,2-dimetilpropan-1-amina



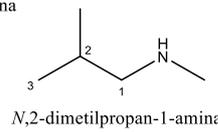
3-metilbutan-2-amina



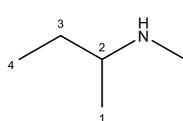
2-metilbutan-2-amina



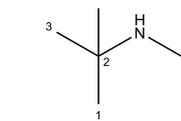
N-metilbutan-1-amina



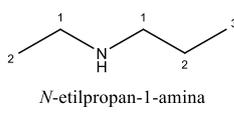
N,2-dimetilpropan-1-amina



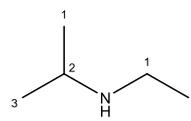
N-metilbutan-2-amina



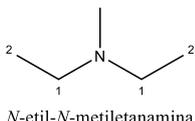
N,2-dimetilpropan-2-amina



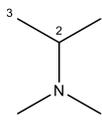
N-etilpropan-1-amina



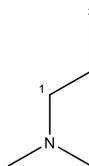
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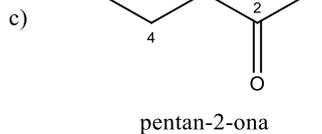
N-etil-N-metiletanamina



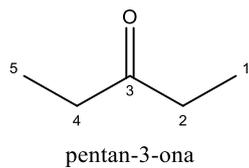
N,N-dimetilpropan-2-amina



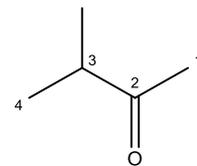
N,N-dimetilpropan-1-amina



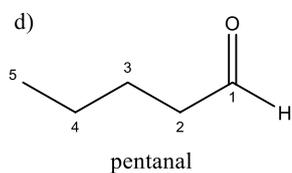
pentan-2-ona



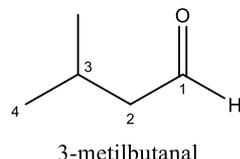
pentan-3-ona



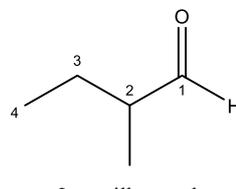
3-metilbutan-2-ona



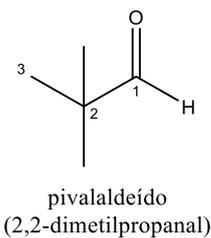
pentanal



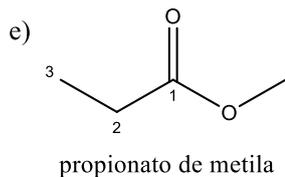
3-metilbutanal



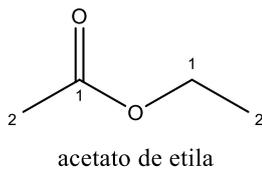
2-metilbutanal



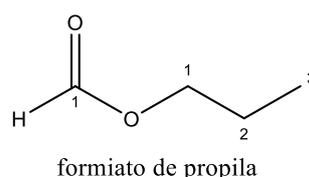
pivalaldeído
(2,2-dimetilpropanal)



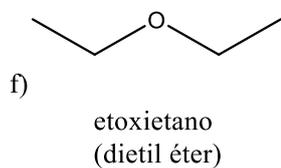
propionato de metila



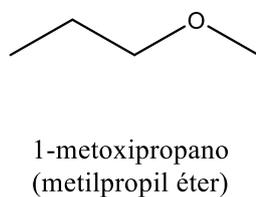
acetato de etila



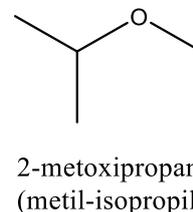
formiato de propila



etoxietano
(diethyl éter)

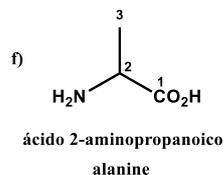
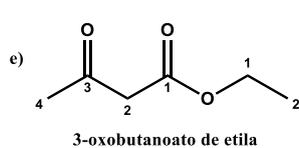
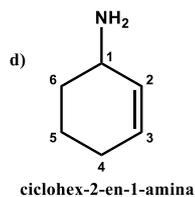
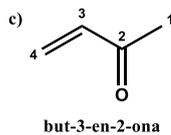
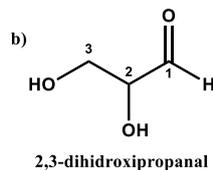
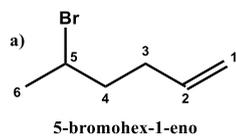


1-metoxipropano
(metilpropil éter)

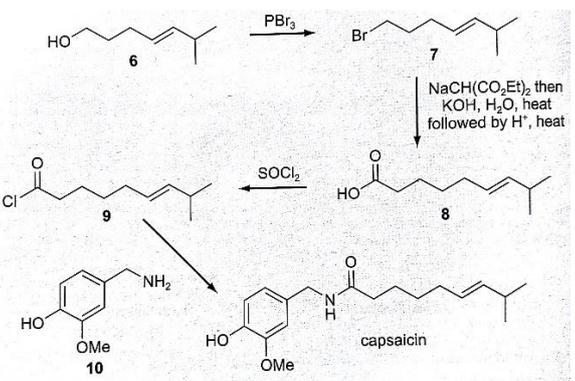


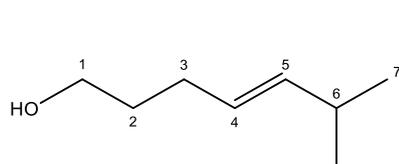
2-metoxipropano
(metil-isopropil-éter)

7) Forneça nomes IUPAC para os compostos multifuncionais abaixo representados.

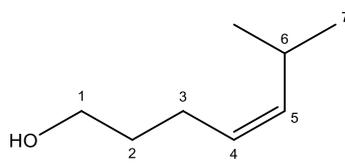


8) O princípio pungente das pimentas vermelhas (*Capsicum annuum*, família Solanaceae) é a capsaicina, cuja foi sintetizada através da rota sintética mostrada abaixo. Responda as questões.

	<p>a) Qual o nome IUPAC do composto 6? Represente a estrutura do estereoisômero de 6 (e dê seu nome);</p> <p>b) No composto 7, o brometo está ligado a um carbono primário, secundário, terciário ou quaternário? Qual o nome IUPAC de 7?</p> <p>c) Na síntese de 8, o sal de sódio foi preparado a partir do $\text{CH}_2(\text{CO}_2\text{Et})_2$, conhecido comumente como malonato de dietila. Represente sua estrutura expandida e forneça seu nome IUPAC do malonato de etila e de 8;</p> <p>d) Forneça o nome IUPAC para 9 e 10;</p> <p>e) Identifique os grupos funcionais da capsaicina.</p> <p>f) Qual o índice de deficiência de hidrogênio na capsaicina?</p>
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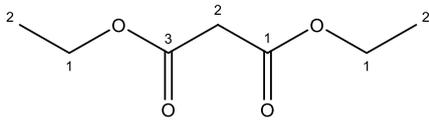


a) (*E*)-6-metil-hept-4-en-1-ol

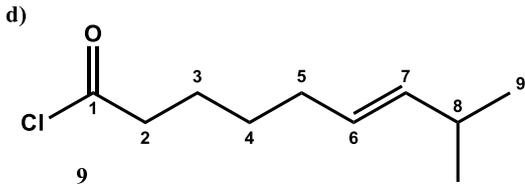


(*Z*)-6-metil-hept-4-en-1-ol

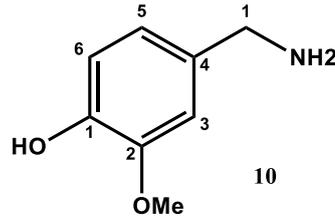
b) Br está num carbono primário



c) malonato de dietila (IUPAC: propanodioato de dietila)

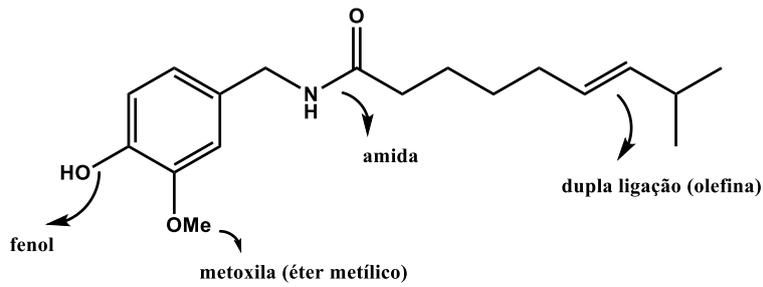


cloreto de (*E*)-8-metilnon-6-enoila

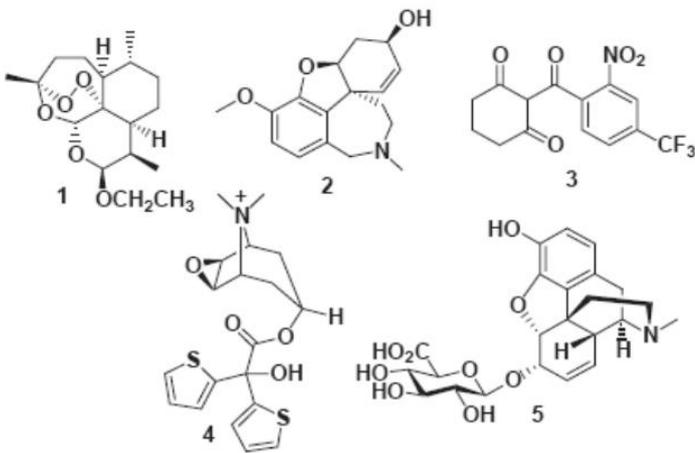


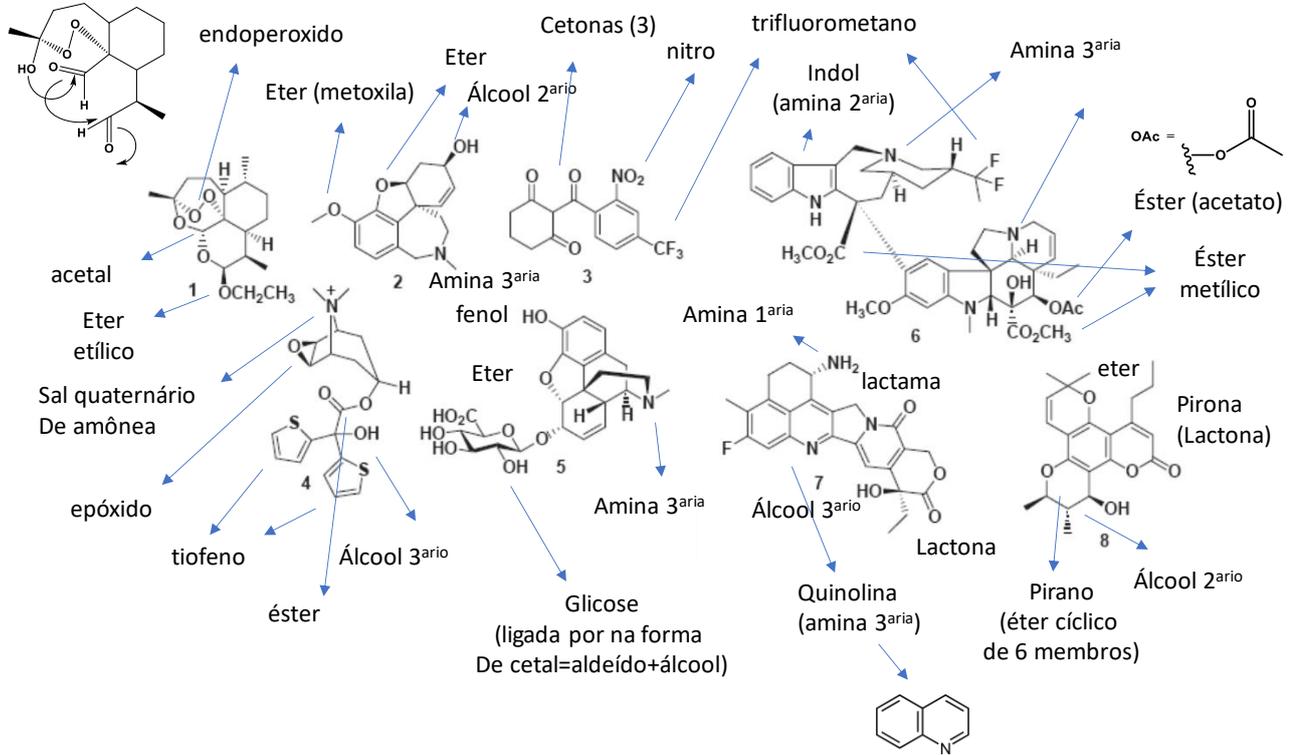
4-(aminometil)-2-metoxifenol

e)



9) Identifique os grupos funcionais presentes nas seguintes substâncias. No caso de aminas ou álcoois, indique se são primária(o)s, secundária(o)s ou terciária(o)s.





10) **Trabalho de pesquisa individual (para ser entregue):** procure um medicamento comercial e apresente o nome comercial (ou de fantasia), nome IUPAC, estrutura química do princípio ativo, um pouco do seu histórico (descoberta e desenvolvimento) as funções orgânicas. Explique qual a lógica para o nome IUPAC.