.

SOLUÇÕES DOS PROBLEMAS PROPOSTOS

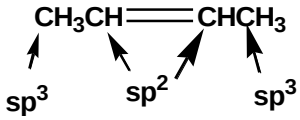
ESTRUTURA e LIGAÇÃO QUÍMICA

P1.

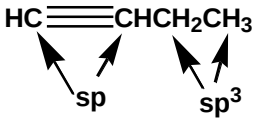
a. D
b. A, B
c. Nenhuma
d. B
e. Nenhuma
f. A, D
g. A
h. C

P2. **a.** 11 σ, 1π
b. 9 σ, 2π

P3. **a.**



b.



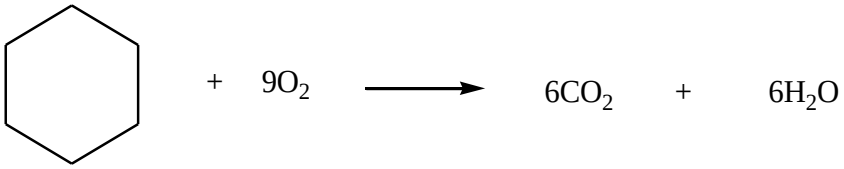
P4. Resposta **b.**
P5. Resposta **d.**

ALCANOS e CICLOALCANOS

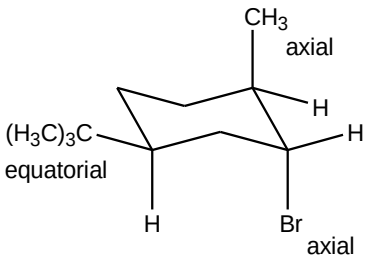
P1:
x = 11, y = 20, z = 13
Menor calor por mole.

P2:
O isómero a)

P3:



P4:



P5:
O *trans*-1-isopropil-4-metilciclohexano tem menor calor de combustão.

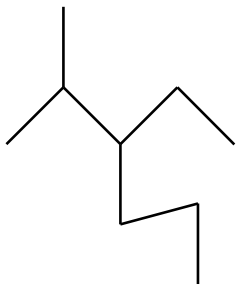
P6:
Alínea a) I é mais estável.

P7:

- **a.** 2,5-Dimetilheptano
- **b.** 7-Etil-3-metildecano
- **c.** 5-metildeca-6-eno-3-ino
- **d.** 3,3-Dimetilpentano.

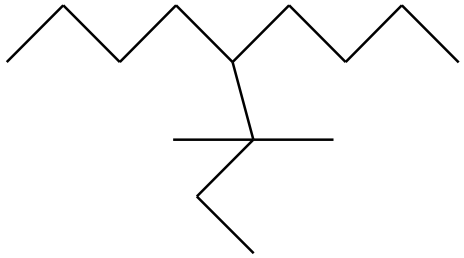
P8:

a.

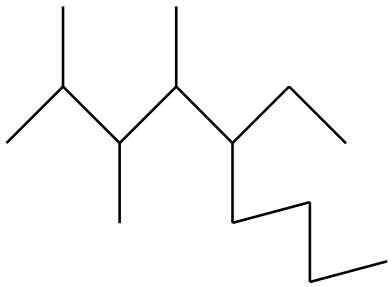


3-etil-2-metilhexano

b.

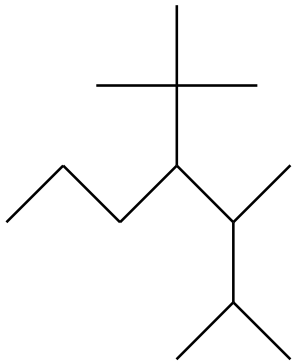


c.



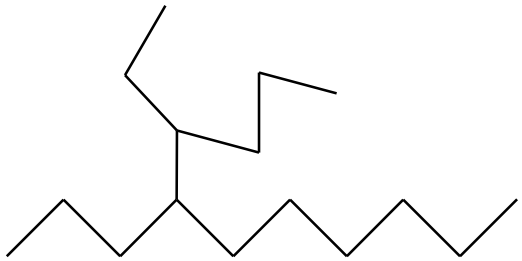
5-etil-2,3,4-trimetilnonano

d.



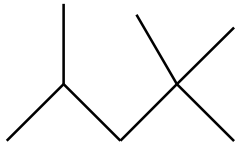
4-*tert*-butil-2,3-dimetilheptano

e.



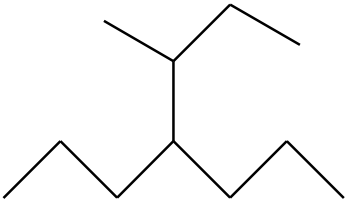
4-etil-5-propilundecano

f.



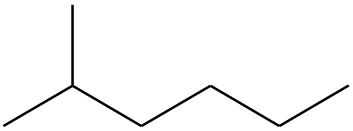
2,2,4-trimetilpentano

g.



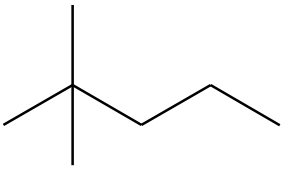
3-metil-4-propilheptano

h.



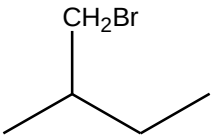
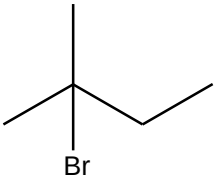
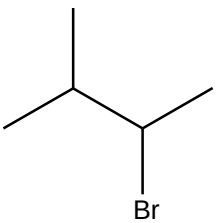
2-metilhexano

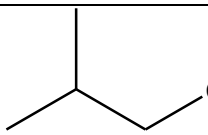
i.



2,2-dimetilpentano

P11:

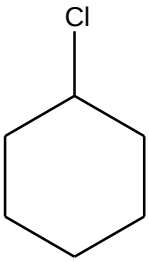
Produtos mono-halogenados	Tipo **H**	Número **H** equivalentes	Reactividade	Percentagem
	1º	6	1 x 6 = 6	(6/1841) x 100 = o.33%
	3º	1	1800 x 1 = 1800	(1800/1841) x 100 = 97.8%
	2º	2	16 x2 = 32	(32/1841) x 100 = 1.7%

	1º	3	1 x 3 = 3	(3/1841) x 100 = 0.16%

Total = 1841

P12: Resolução análoga à do problema anterior.

P13:
Apenas um produto é obtido por monocloração do ciclo-hexano:



P14: O alcano é o propano.

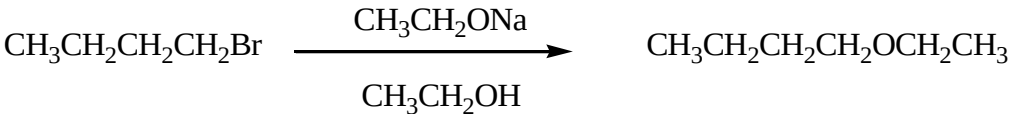
ESTEREOISOMERIA

P1. A resposta correcta é a d)
P2. A resposta correcta é a c)
P3. A resposta correcta é a d)
P4. A resposta correcta é a d)
P5. A resposta correcta é a b)

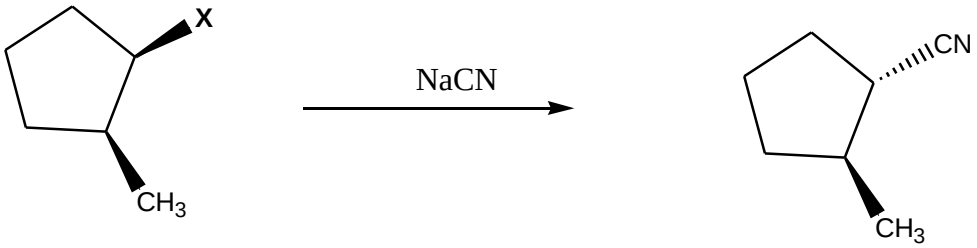
S_N2 / S_N1 – SUBSTITUIÇÃO NUCLEOFÍLICA

P1.

a.



b.

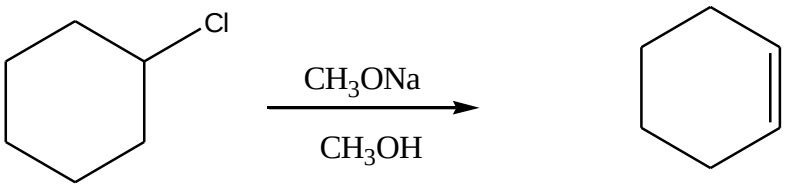


(**X**= OTs, Br, I)

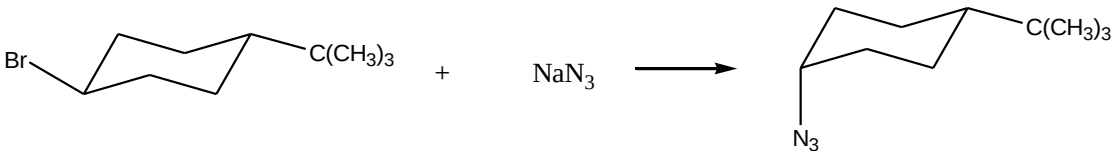
c.

1-Cloro-3-metilbutano azida de sódio

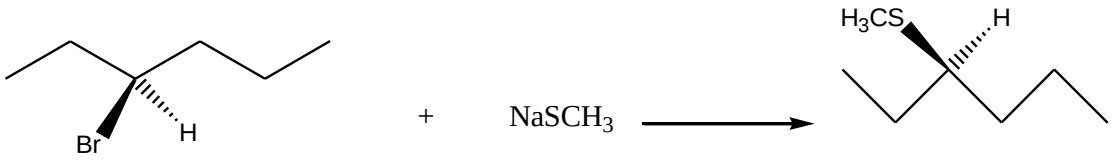
d.



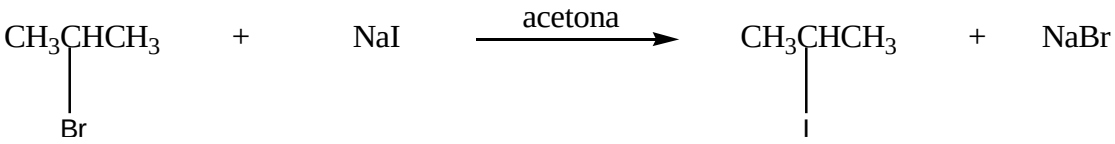
e.



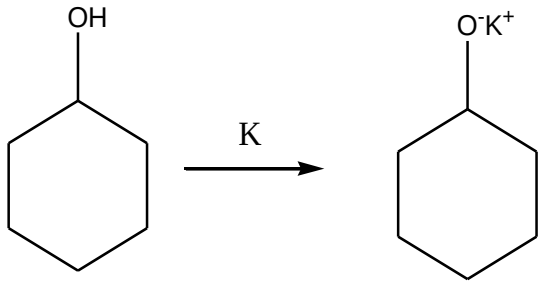
f.



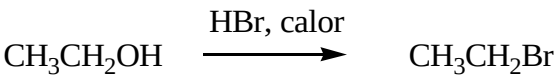
P2. O iodeto de sódio é solúvel em acetona, enquanto que o sub-produto da reacção, brometo de sódio, não é. De acordo com o princípio de Le Chatelier, a reacção favorecerá a direcção que substitui o componente removido da solução, ou seja, o produto orgânico da reacção.



P3. Estruturas de **A** a **D**:

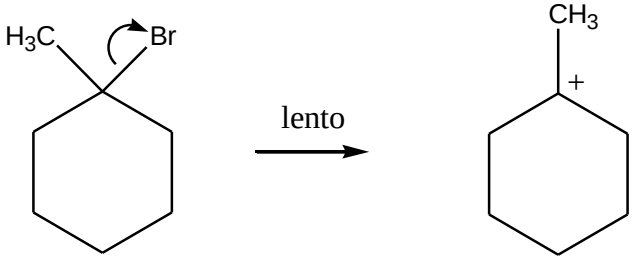


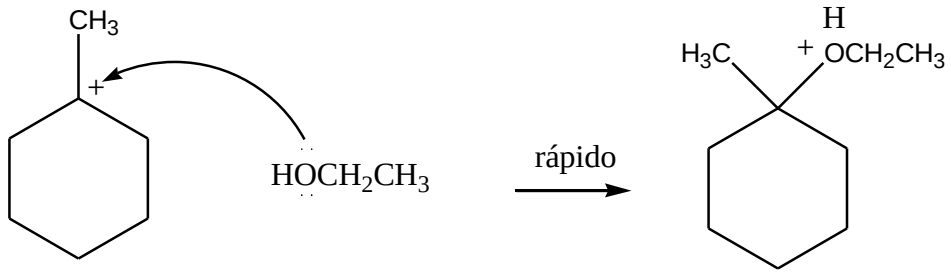
A B

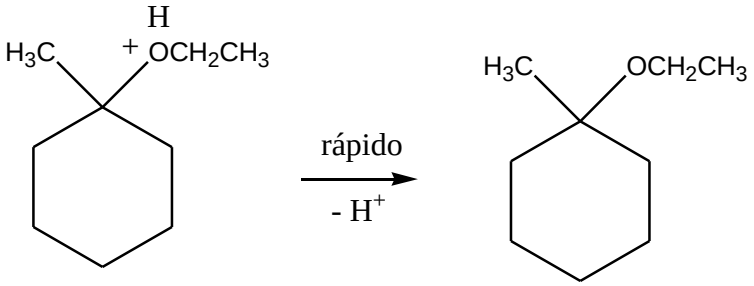


C D

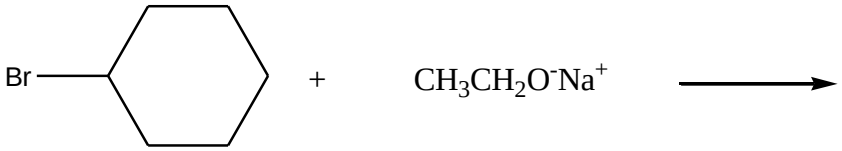
P4.







P5. Na reacção



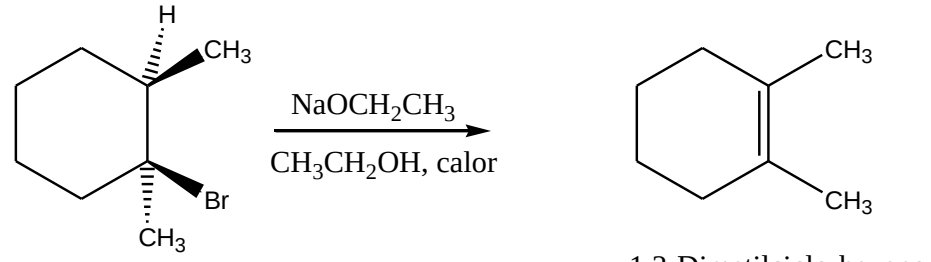
o produto principal forma-se através:

d. reacção E2

E2 / E1 - ELIMINAÇÃO

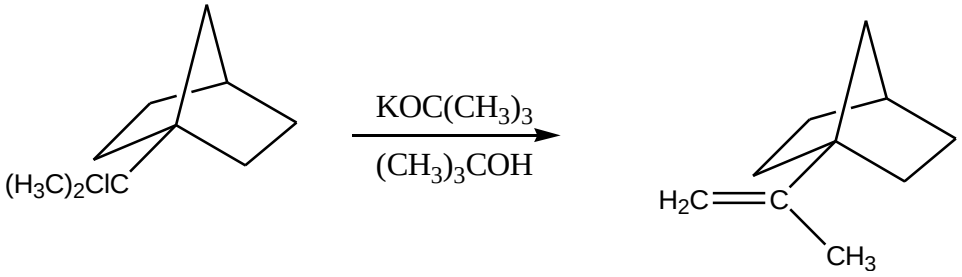
P1.

a.

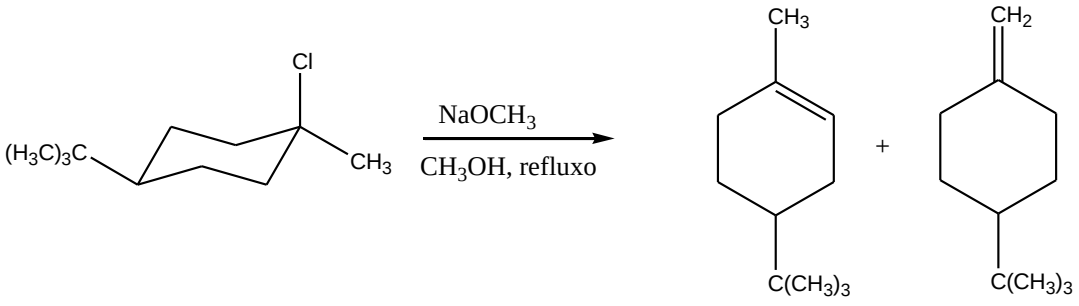


1,2-Dimetilciclo-hexeno

b.

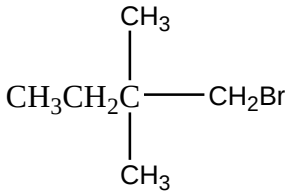


c.

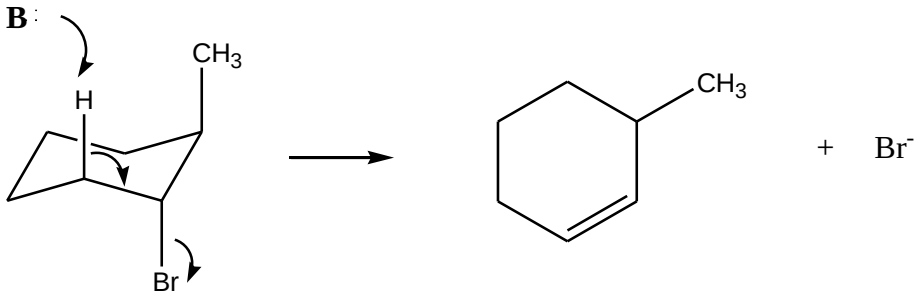


produto
maioritário
(mais substituído)

P2. Isómero $C_6H_{13}Br$ que não reage em eliminação E2:

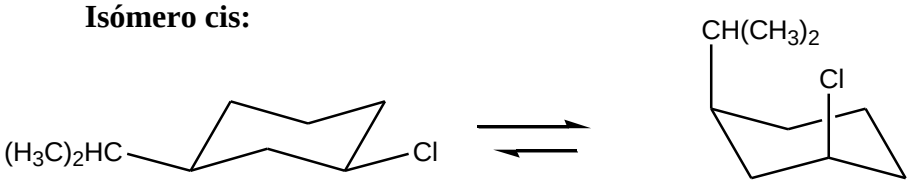


P3.

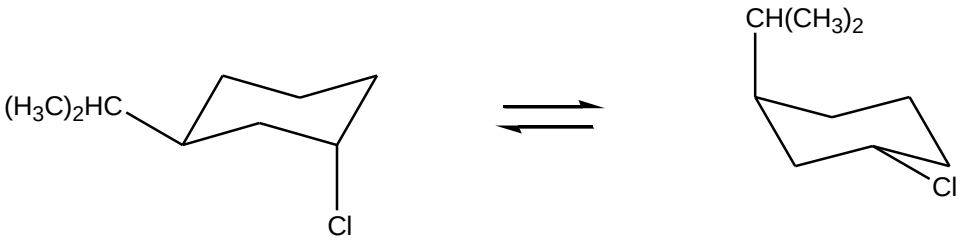


P4.

Isómero cis:



Isómero trans:



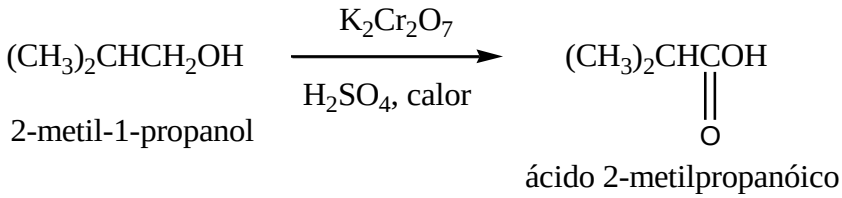
O isómero trans reagirá mais rapidamente, devido à conformação que possui com o grupo isopropilo equarorial e o Cl axial, favorecendo E2.

P5. Afirmação verdadeira, no que respeita a reacções E2 de haletos de alquilo:

3. A ligação C-H e a ligação C-X são quebradas em simultâneo.

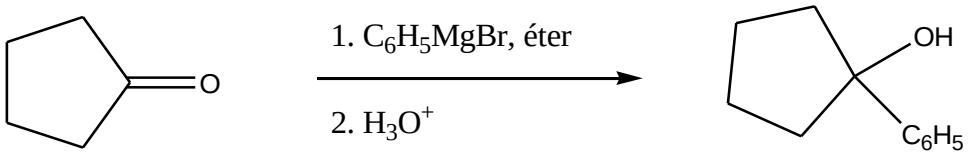
ÁLCOOIS e ÉTERES

P1.



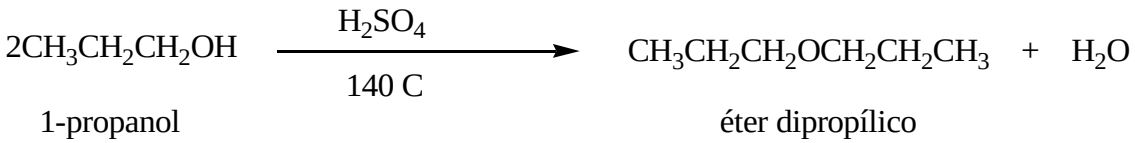
2-metil-1-propanol — ácido 2-metilpropanóico

P2.



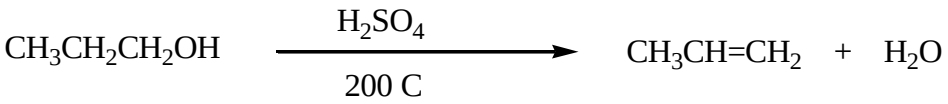
P3.

a.



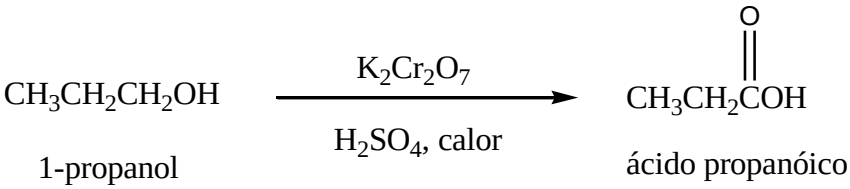
1-propanol — éter dipropílico

b.



1-propanol — propeno

c.

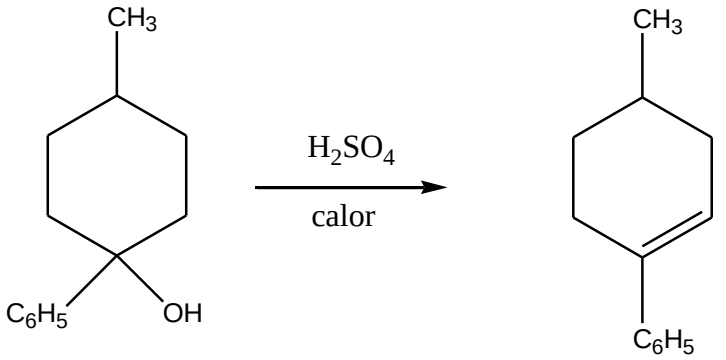


1-propanol — ácido propanóico

P4.

1-propanol ácido acético acetato de propilo

P5.



4-metil-1-fenilciclo-hexeno