Lecture 7

Organic Chemistry: Fundamentals and Applications (CSO201A)

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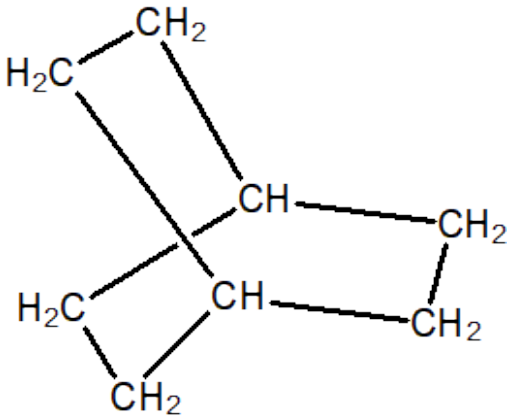
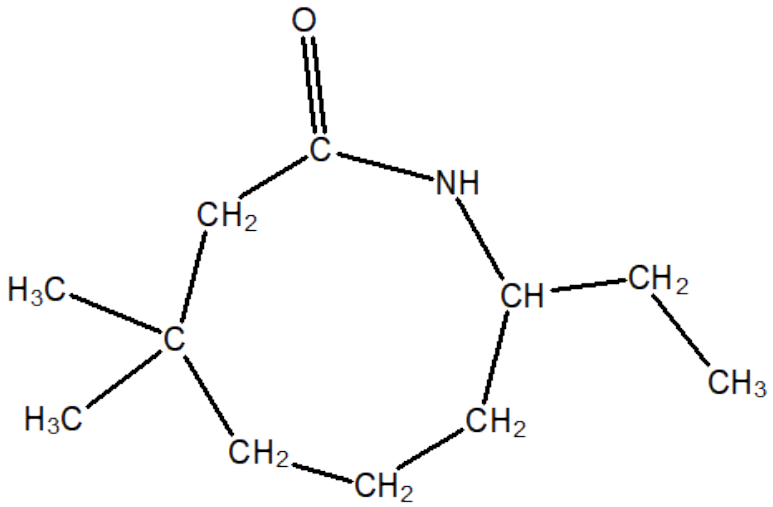
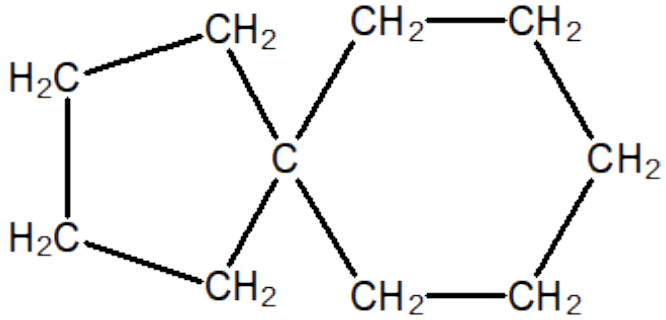
You will be able to name any cyclic organic molecule as per IUPAC rules

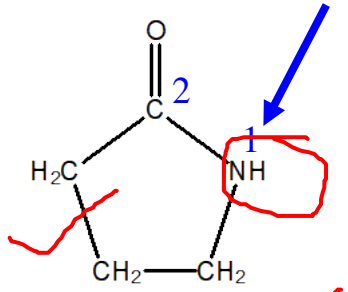




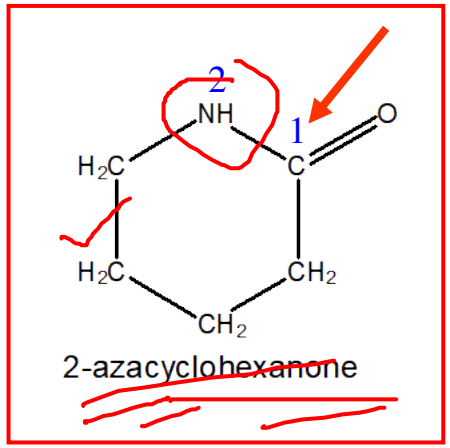


Alicyclic Compounds Contd.

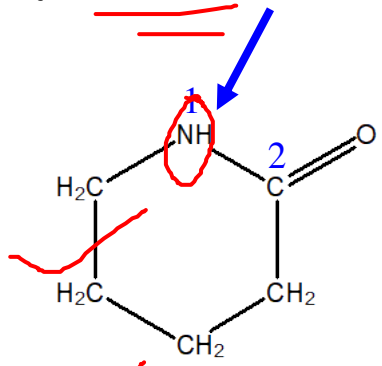
Alicyclic Compounds Containing Functional Groups: (Lactums) 1. Cyclic amides (lactum): 2-azacycloalkanone



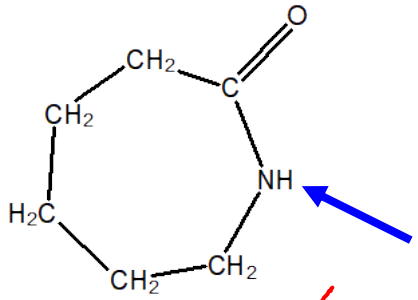
pyrrolidin-2-one
Preferred IUPAC Name (PIN)



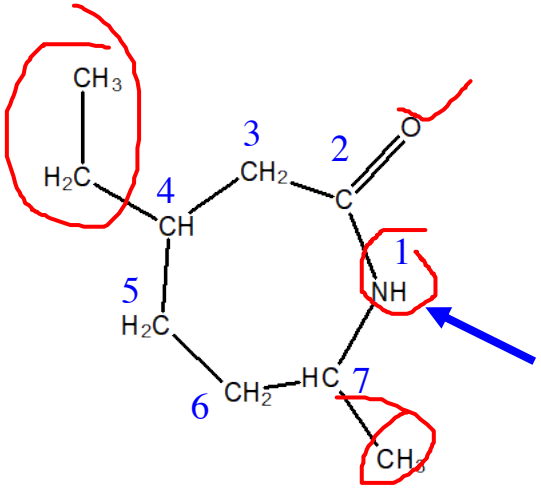
2-azacyclohexanone



piperidin-2-one
Preferred IUPAC Name (PIN)

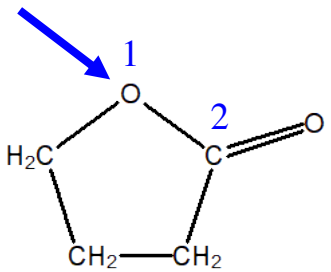


azepan-2-one
Preferred IUPAC Name (PIN)

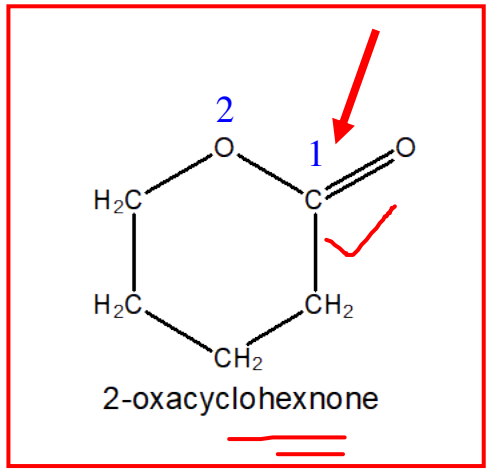


4-ethyl-7-methylazepan-2-one
Preferred IUPAC Name (PIN)

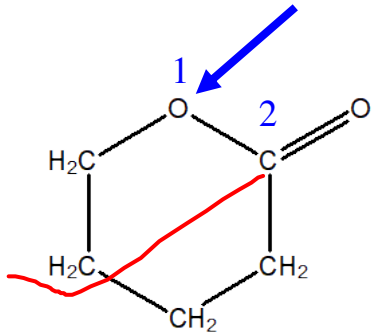
Alicyclic Compounds Containing Functional Groups: (Lactones) 2. Cyclic esters (lactone): 2-oxacycloalkanone



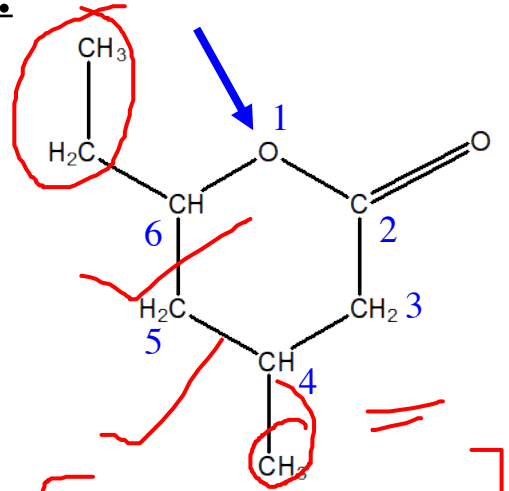
oxolan-2-one
Preferred IUPAC Name (PIN)



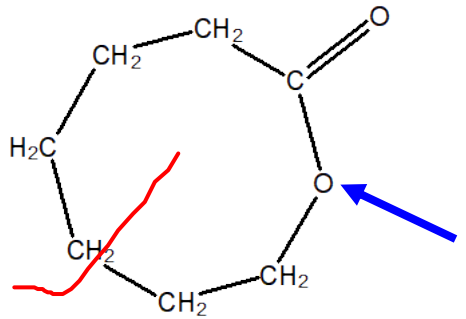
2-oxacyclohexnone



oxan-2-one
Preferred IUPAC Name (PIN)



6-ethyl-4-methyloxan-2-one
Preferred IUPAC Name (PIN)



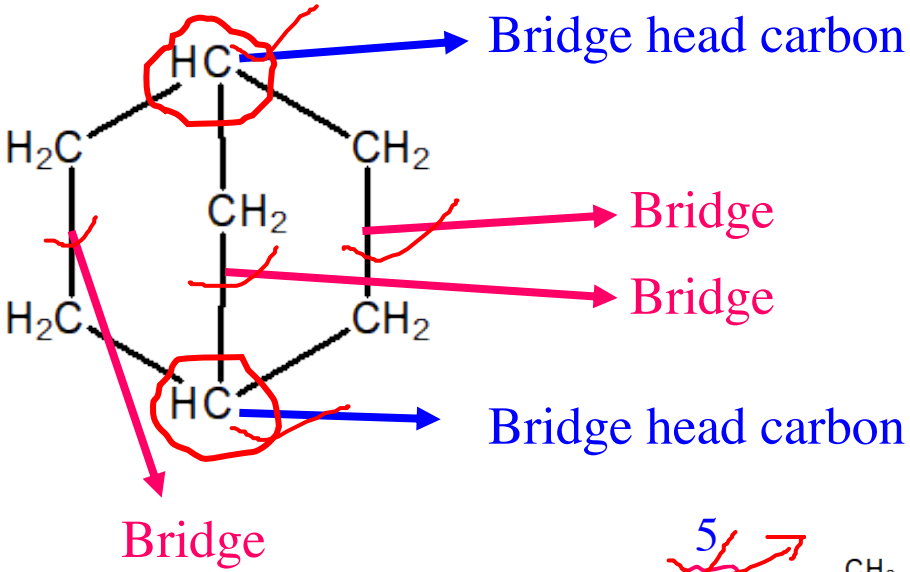
oxocan-2-one
Preferred IUPAC Name (PIN)

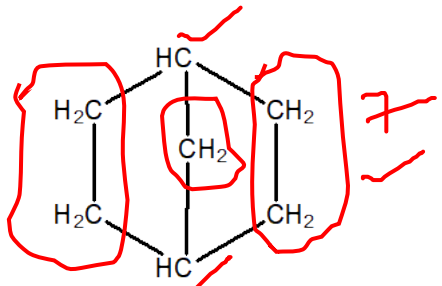
7. Bicyclo Alkanes

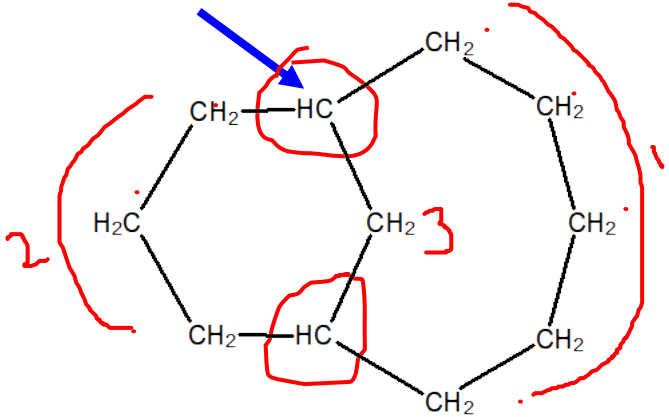
Bicyclo alkanes:

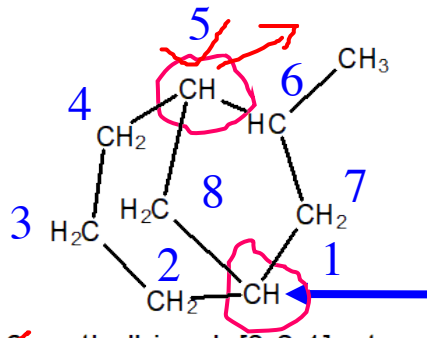
1. Write prefix Bicyclo before alkane and the number of bridge carbons in brackets between the two.
2. Write the numbers in descending order within brackets→ "Bicyclo [x.y.z] alkane". Where, x>y>z.
3. If substituents present:

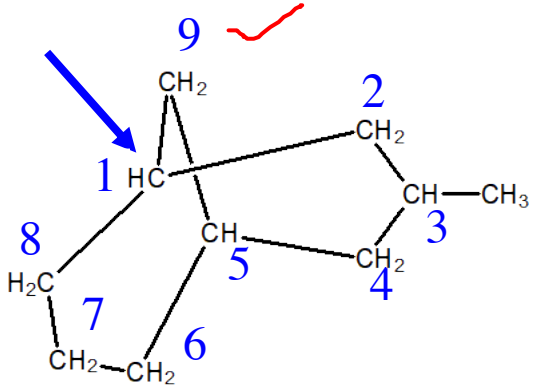
1st bridge head →longest bridge →medium-sized bridge →smallest bridge.

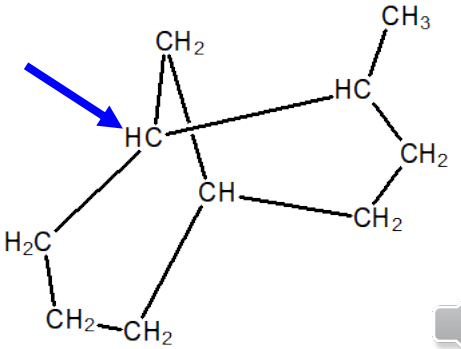



bicyclo[2.2.1]heptane


bicyclo[5.3.1]undecane


6-methylbicyclo[3.2.1]octane

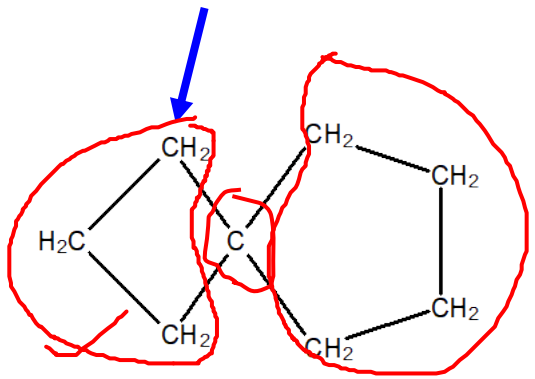

3-methylbicyclo[3.3.1]nonane


2-methylbicyclo[3.3.1]nonane

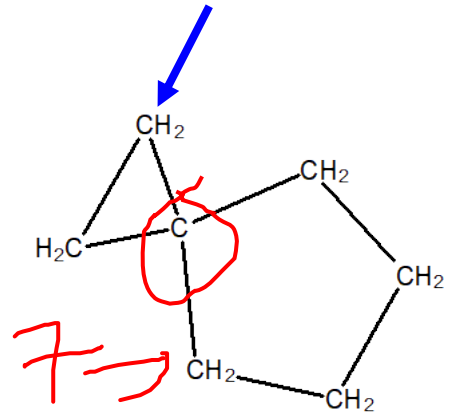
8. Spiro Compounds

Spiro Compounds:

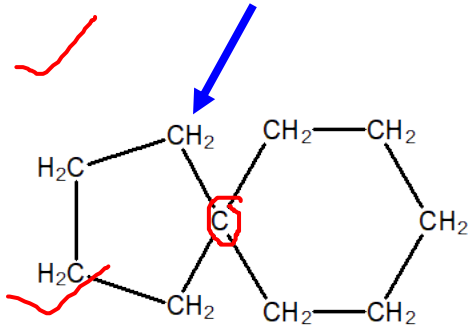
1. Use prefix Spiro before alkane and number of carbons of two rings in between.
2. Write the number of carbons of two rings in ascending order within brackets.
3. If substituents: smaller ring's carbon adjacent to quaternary spiro carbon gets 1st.



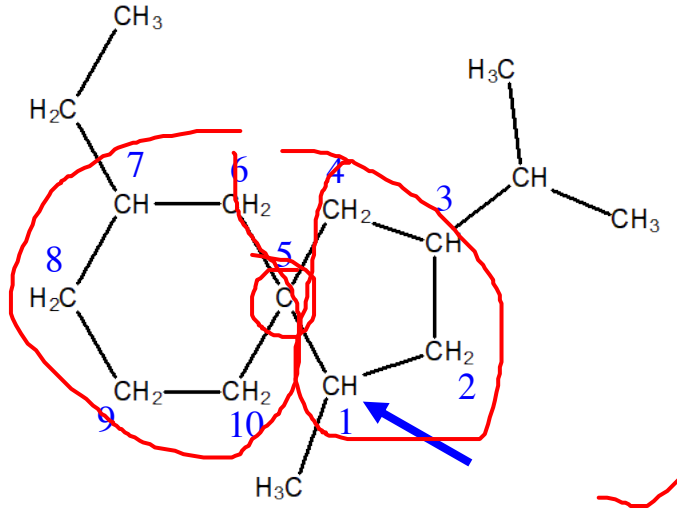
spiro[3.4]octane



spiro[2.4]heptane



spiro[4.5]decane



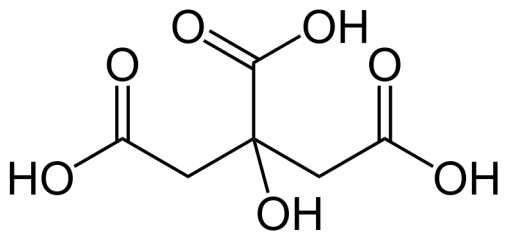
7-ethyl-1-methyl-3-(propan-2-yl)spiro[4.5]decane

9. Trivial Naming

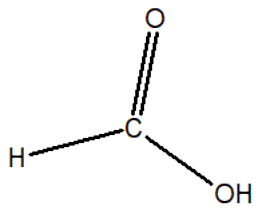
Common/Trivial naming: (Before IUPAC Naming)

1. Naming based on their origin/source or specific property.

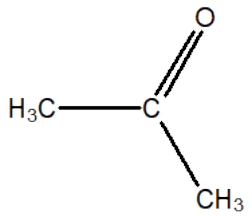
1. Citric acid → citrus fruits
2. Formic acid → formica (ant in latin)
3. $CHCl_3$ → chloroform (chlorination of drinking water & swimming pools)
4. CH_3-CO-CH_3 → acetone
5. CH_3-COOH → acetic acid
6. C_6H_6 → benzene (gum benzoin, aromatic resin)
7. CH_4 → methane



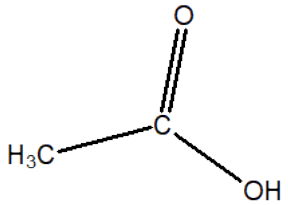
Citric acid



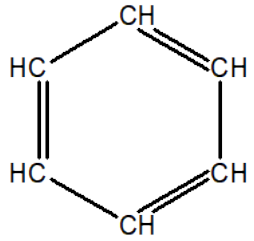
formic acid



propan-2-one



acetic acid



benzene

IUPAC Advanced-2 Course: Review

Alicyclic Compounds Containing Functional Groups: (Lactums)

1. Cyclic amides (lactum): 2-azacycloalkanone

Alicyclic Compounds Containing Functional Groups: (Lactones)

2. Cyclic esters (lactone): 2-oxacycloalkanone

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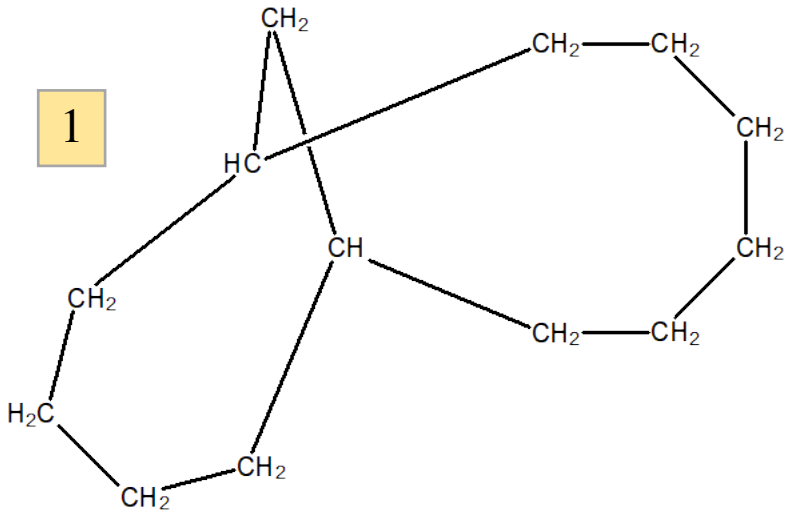
PRACTICE

1



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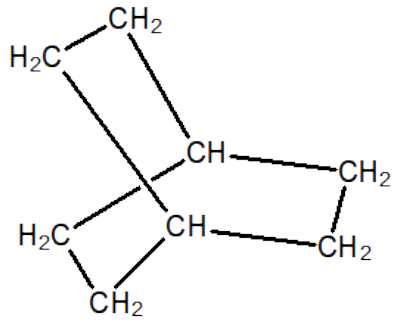

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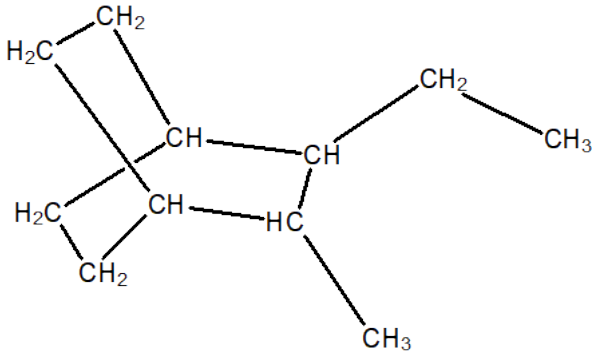

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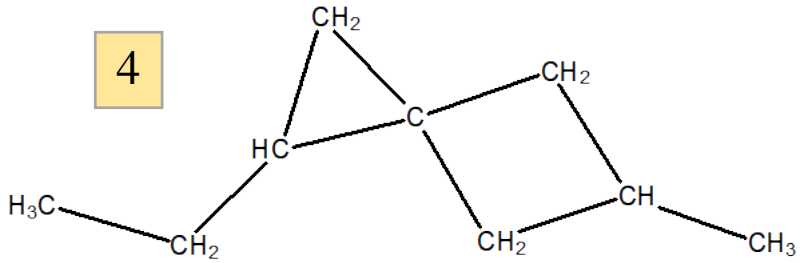

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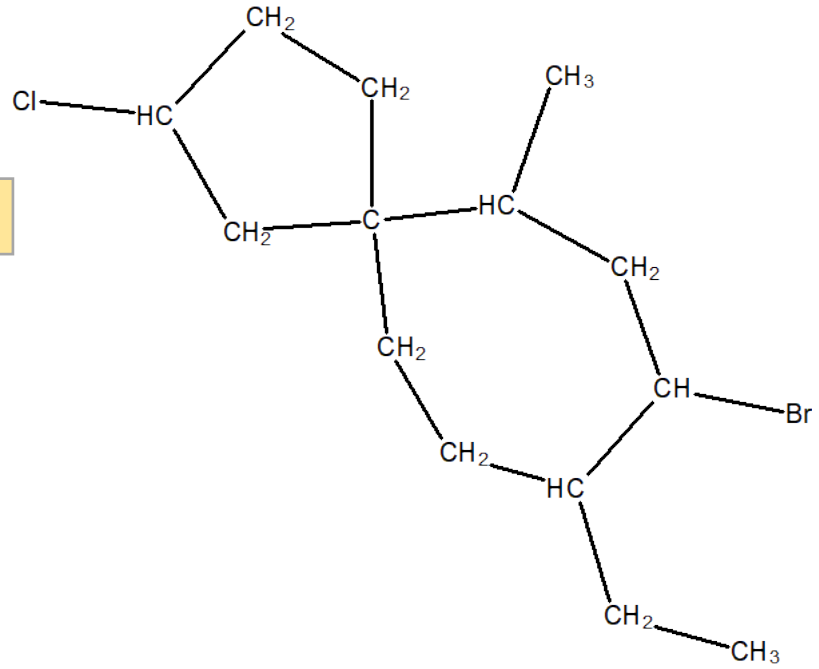

PRACTICE

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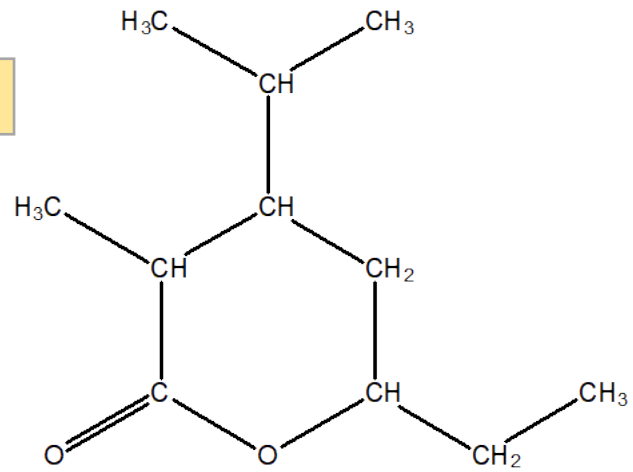

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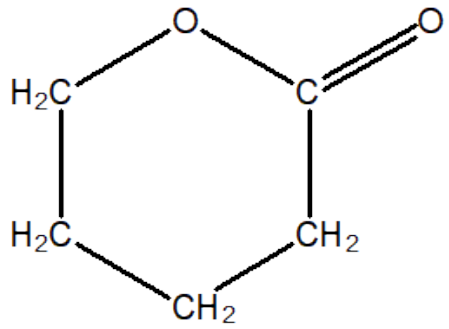

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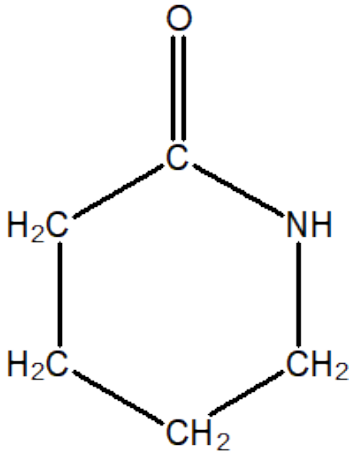

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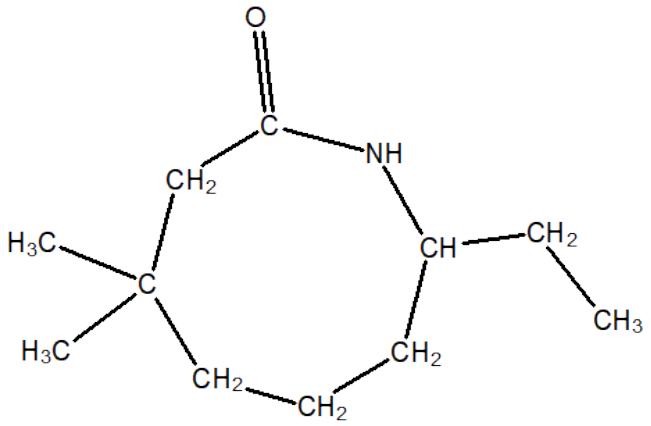

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