IUPAC Of Spiro and Bicyclo Compounds

Special class

Sharad kothari • Nov 1, 2020

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IUPAC of Spiro and Bicyclo

FOR
IIT – JEE 2022
ASPIRANTS

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FEATURES

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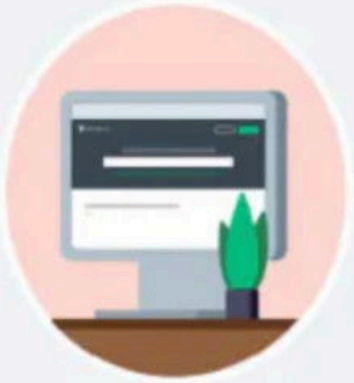
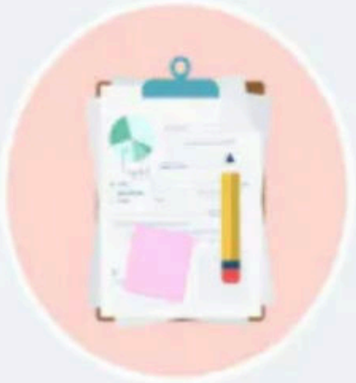
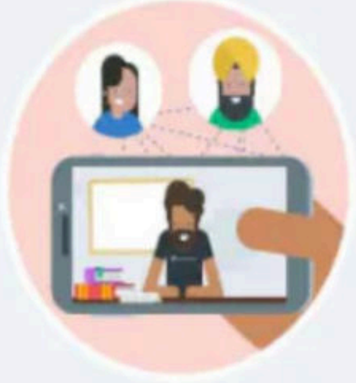


Unlimited access to all courses



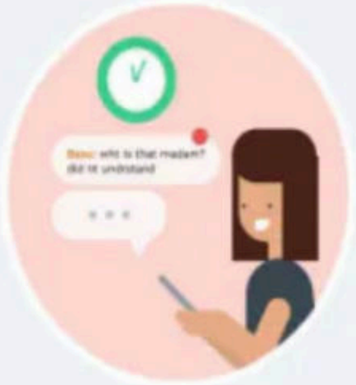
Practice Tests

Batch Courses

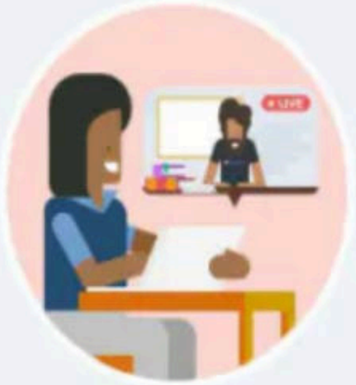


Mentorship and guidance

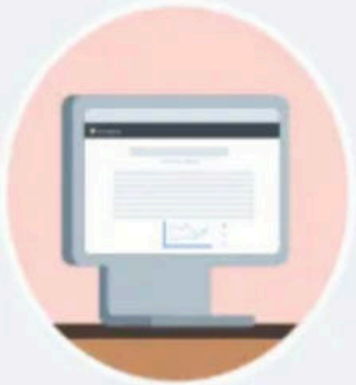
Exhaustive coverage of syllabus



Regular doubt-clearing and Answer writing sessions



Live Test Series



Study Material (PDF format)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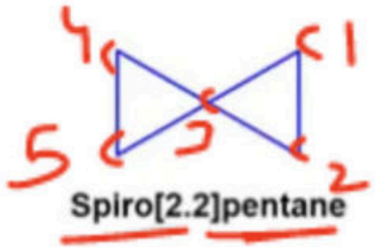
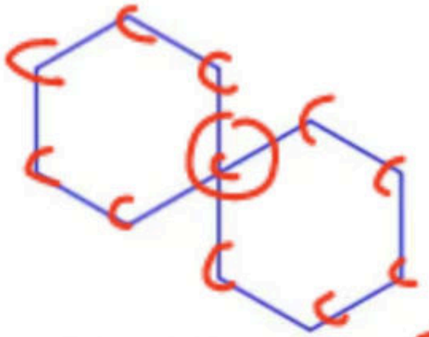
Spiro

IUPAC names for ***spiro alkanes*** have the format **spiro[a.b]parent name**.

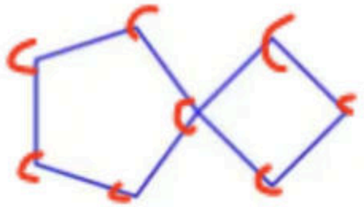
1. Count the **total** number of carbons across the entire molecule. This tells you the alkane ***parent name*** that goes at the end.
2. Count the number of carbons to the left, and to the right of your spiro-carbon center. These numbers are **a** and **b** in your IUPAC name, listed from lowest to highest.
3. Write your final IUPAC name as **spiro[a.b]parent name**.



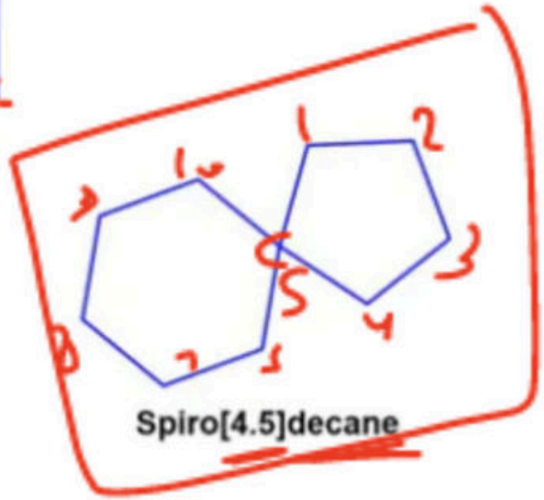
Spiro[2.2]pentane



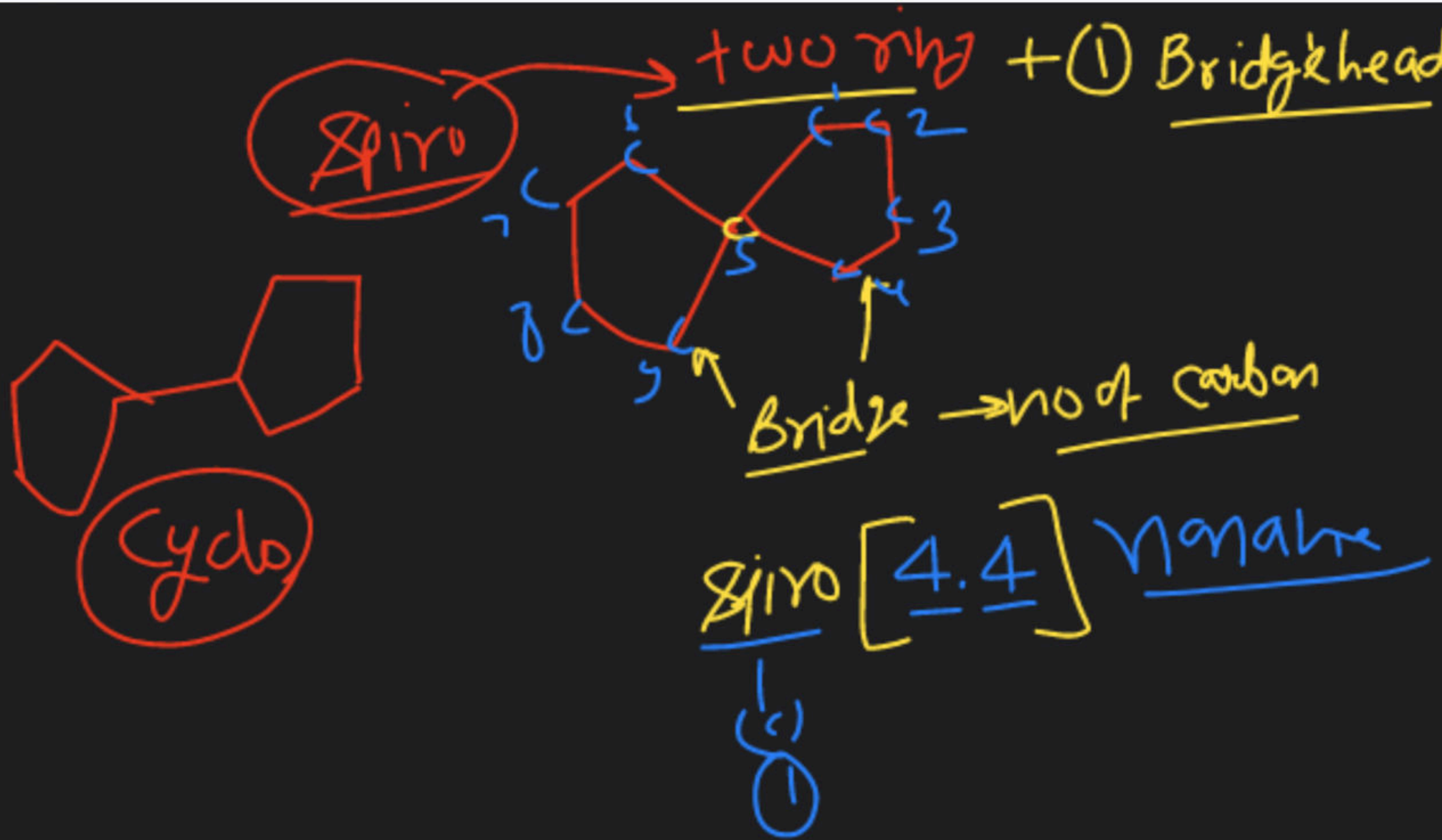
Spiro[5.5]undecane

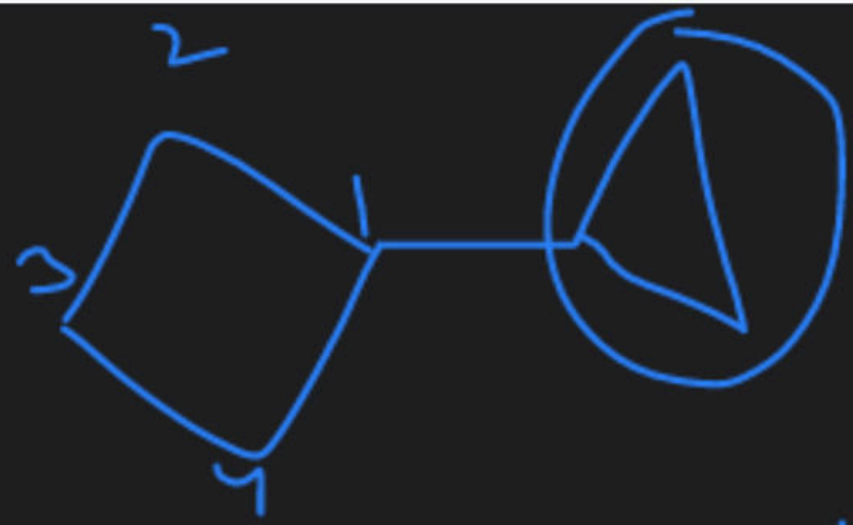


Spiro[3.4]octane



Spiro[4.5]decane


two ring +(1) Bridgehead
Spiro
Cyclo
1
2
3
4
5
6
7
Bridge → no of carbon
Spiro [4.4] Nonane
(1)
(1)



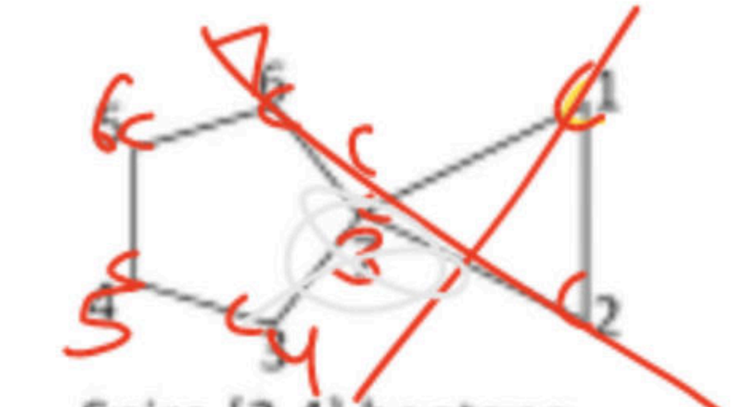
IUPAC no:

1. Small Bridge C
2. Bivo carbon
3. Large Bridge C

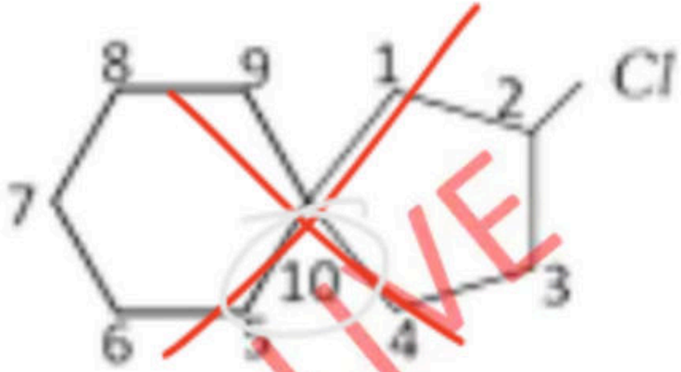
Writing rule: cyclopropyl cyclobutane

Spiro [2.3] hexane

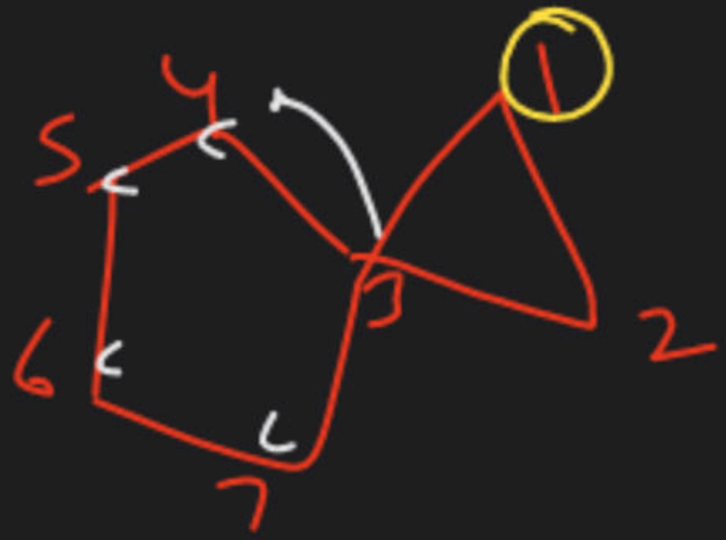
(3 ~~2~~)

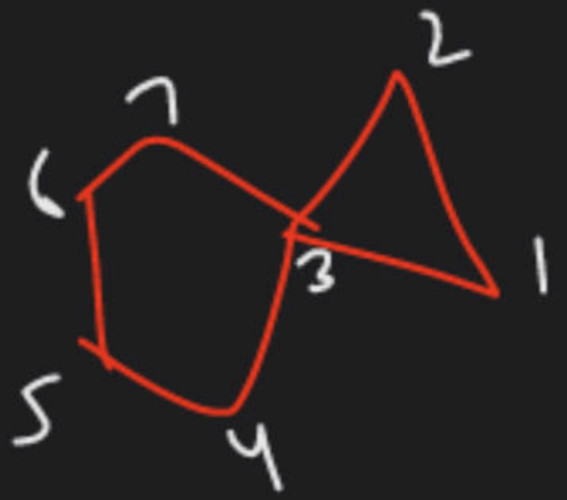


Spiro [2.4] heptane



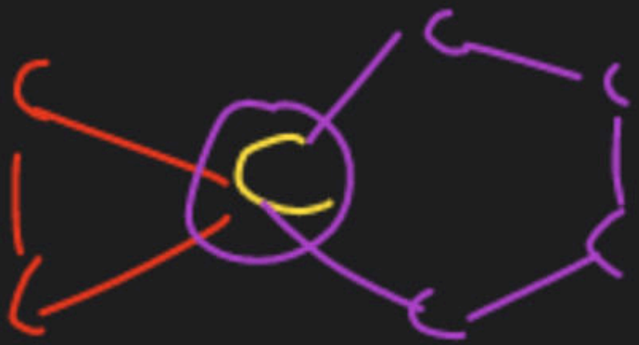
2-Chlorospiro [3.5] decane



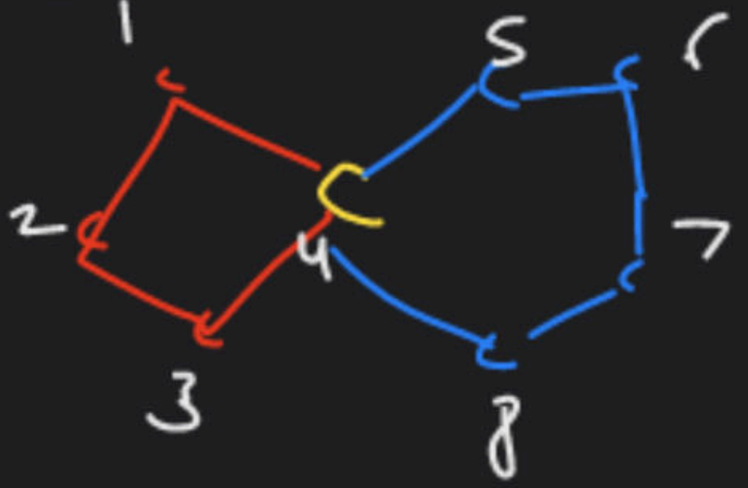


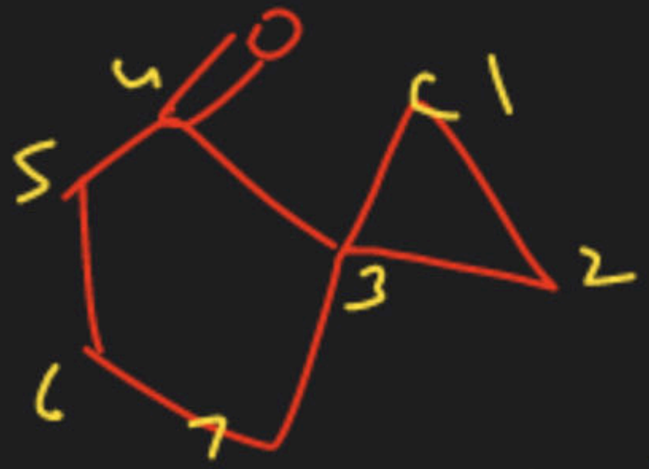
Spin [2.4] heptane

Spiro [2.4] heptane

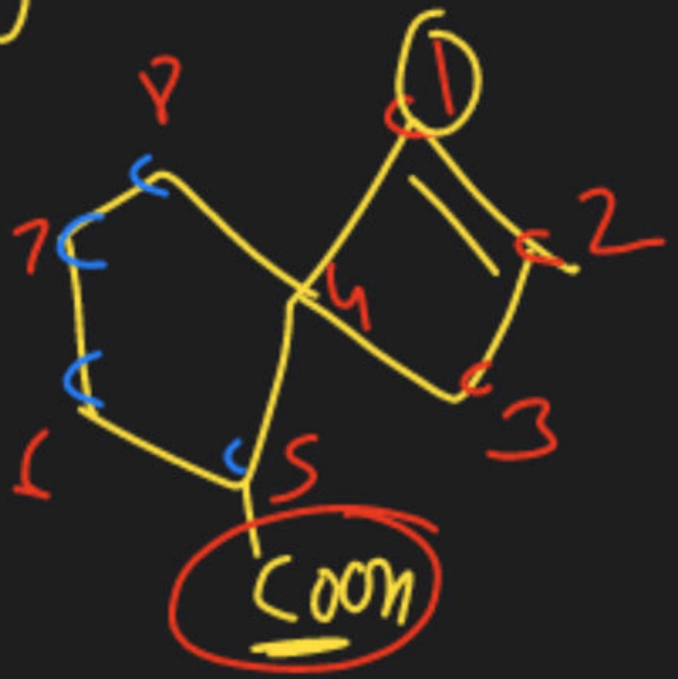


Spiro [3.4] Octane

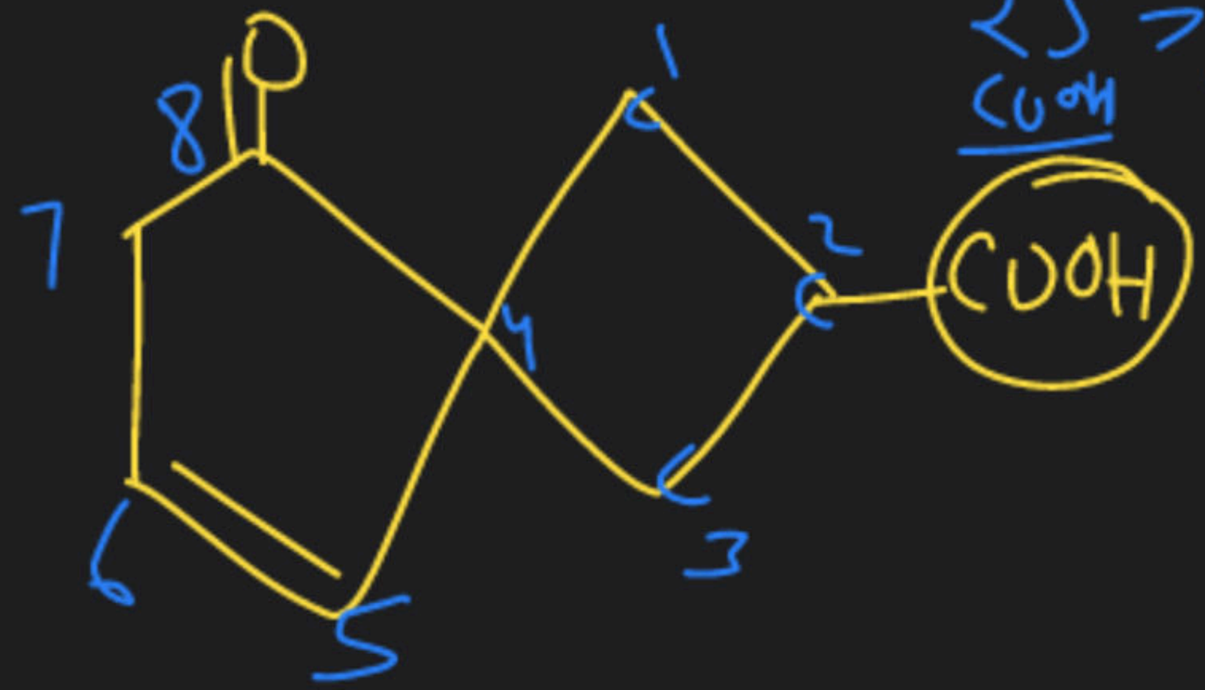




Spiro[2.4] Heptan-4-one



Spiro[3.4] Oct-1-ene-5-carboxylic acid



2.5 > 1.5 > 2.1

COOH (=O) CO

A 1
B 2
C 3
D 7

2.1 + 1.6 + word root + 1.5 + 2.5

8-oxo Spiro[3.4] Oct-5-one-2-carboxylic acid

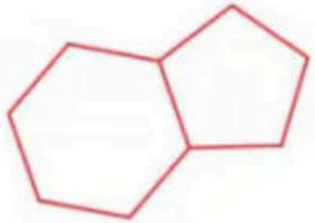
Bicyclic Alkanes

Bicyclo

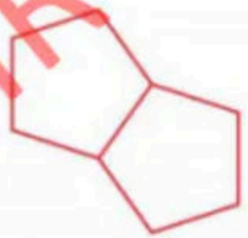
IUPAC names for ***bicylic alkanes*** have the format **bicyclo[a.b.c]parent name**.

1. Count the **total** number of carbons across the entire molecule. This tells you the alkane ***parent name*** that goes at the end.
2. Count the number of carbons to the left, and to the right, and above your *bridgehead carbons*. These numbers are a, b, and c in your IUPAC name, listed from highest to lowest.
3. Write your final IUPAC name as bicyclo[a.b.c]parent name.

Bicyclo[1.1.0]butane

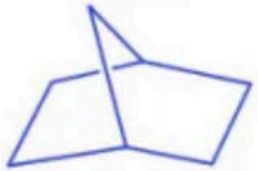


Bicyclo[4.3.0]nonane

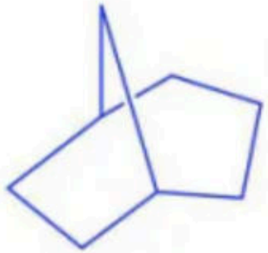


Bicyclo[3.3.0]octane

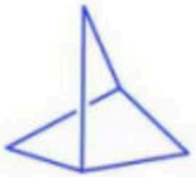
Bicyclo[3.2.0]heptane



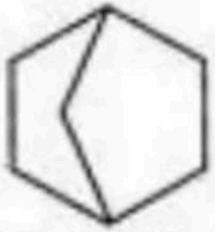
Bicyclo[2.2.1]heptane



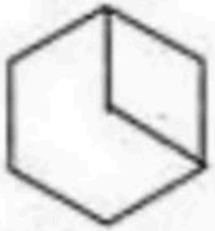
Bicyclo[3.2.1]octane



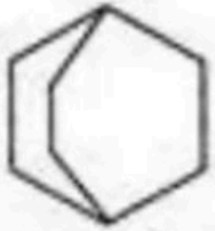
Bicyclo[1.1.1]pentane



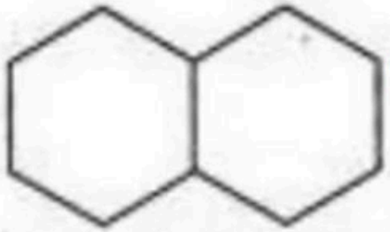
Bicyclo [2, 2, 1] heptane
(also called norbornane)



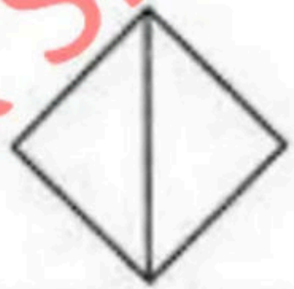
Bicyclo [3, 1, 1] heptane



Bicyclo [2, 2, 2] octane



Bicyclo [4, 4, 0] decane
(also called decalin)

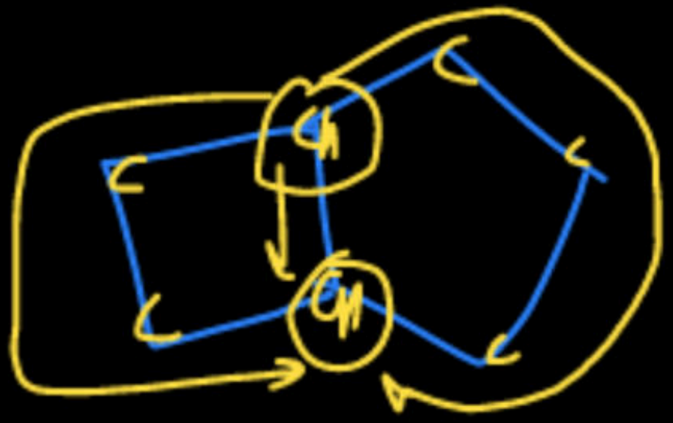


Bicyclo [1, 1, 0] butane

Bicyclo

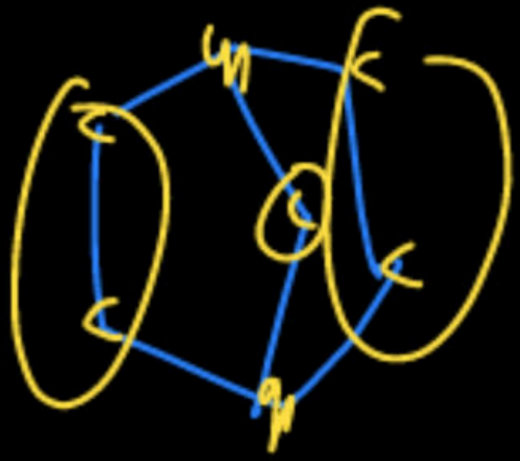
Bridge bicyclic

Fused



2 bridgehead + (3) Bridge

Bicyclo [3.2.0]

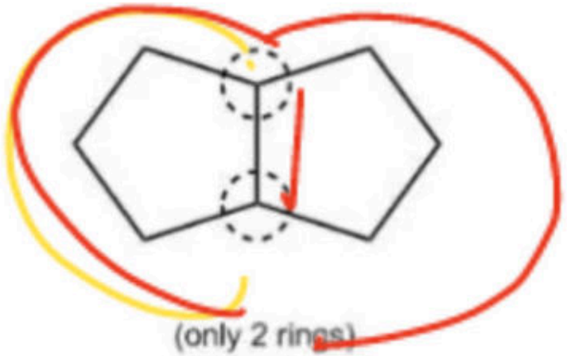


Bicyclo [2.2.1]

Types of Bicyclic Molecules

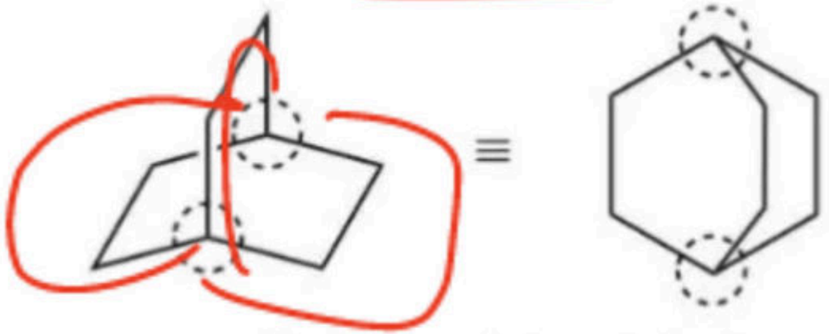
Basically there two general categories of bicyclics:

Fused Bicyclic



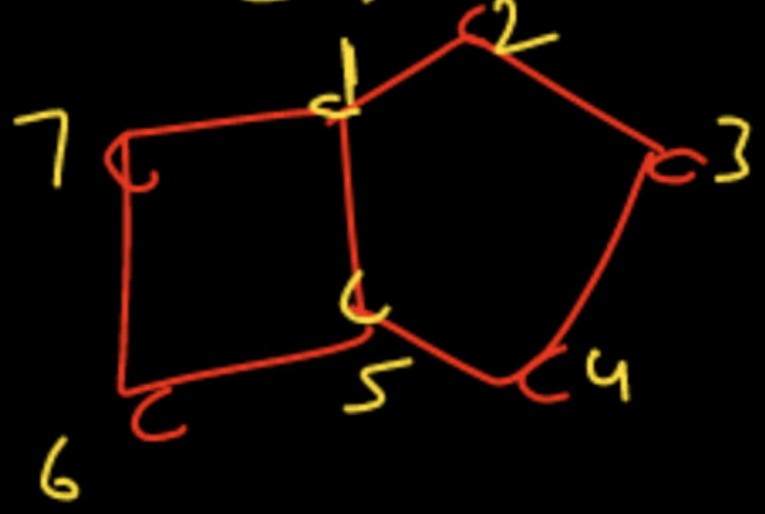
(only 2 rings)

Bridged Bicyclic



(there are actually 3 rings in there)

Large — Small



Bicycle [3.2.0] heptare

Bridge

Small → Large

Spino [3.4] Octave

Bridge

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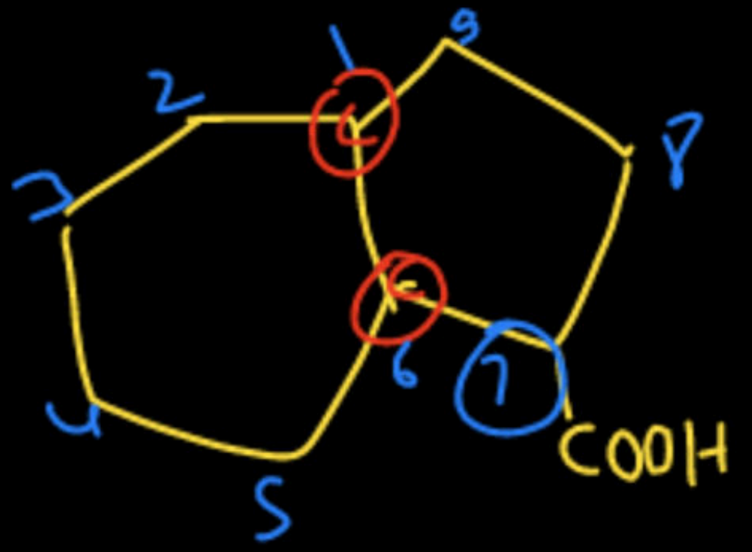

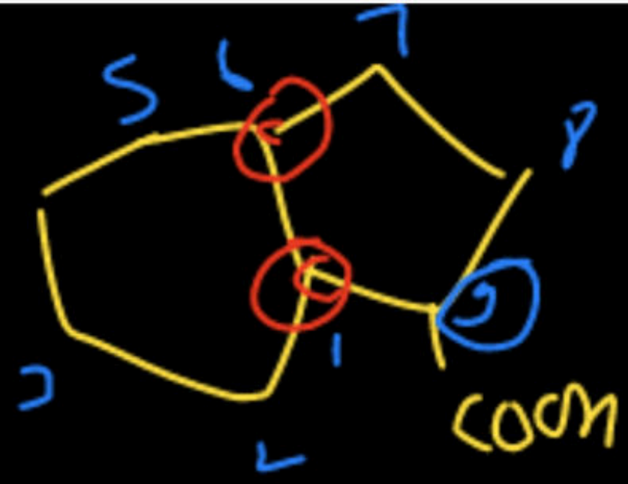

Bicyclo[4.3.0] nonane — 7-Carboxylic acid

A 1
B 2
C 4
D 7

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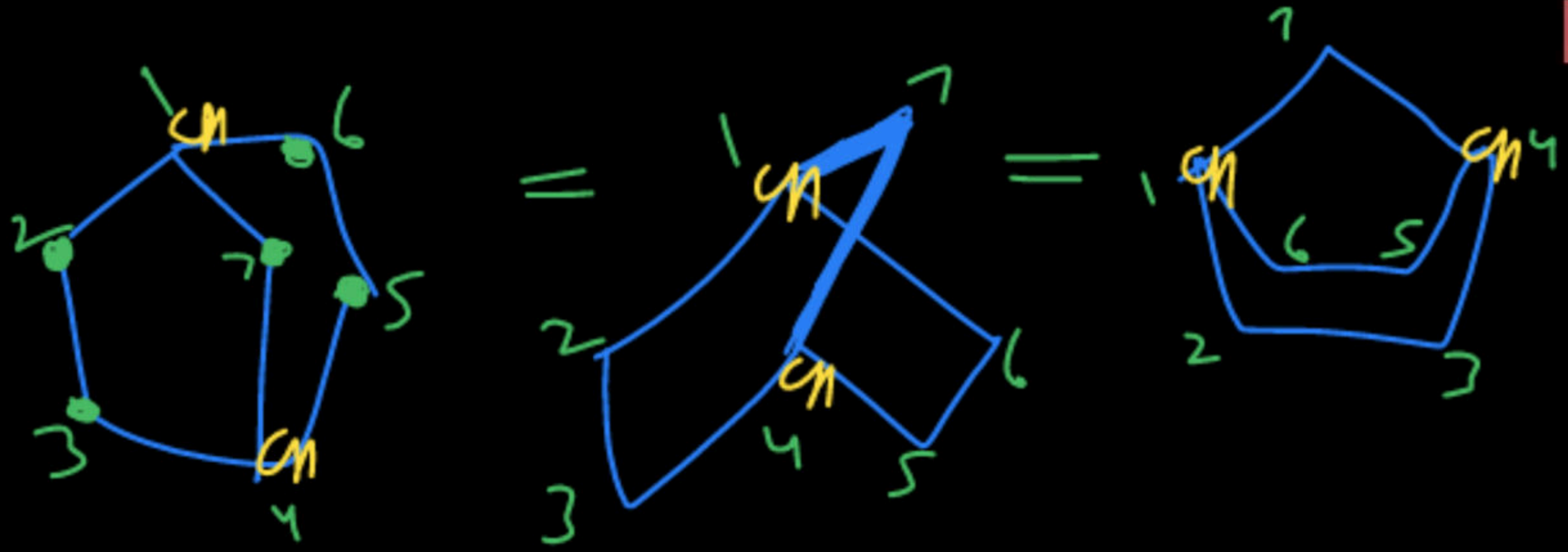
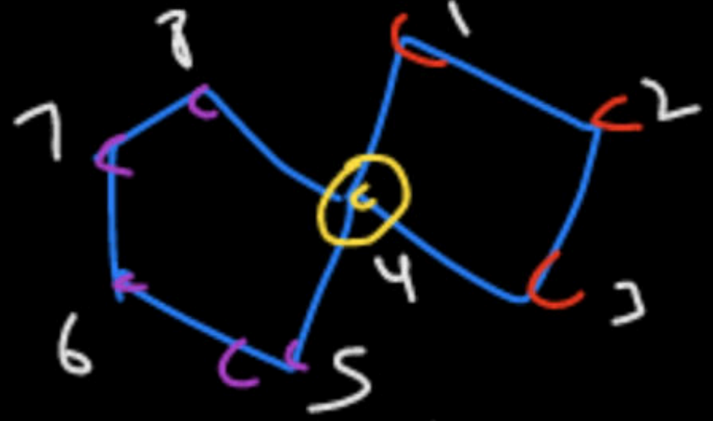
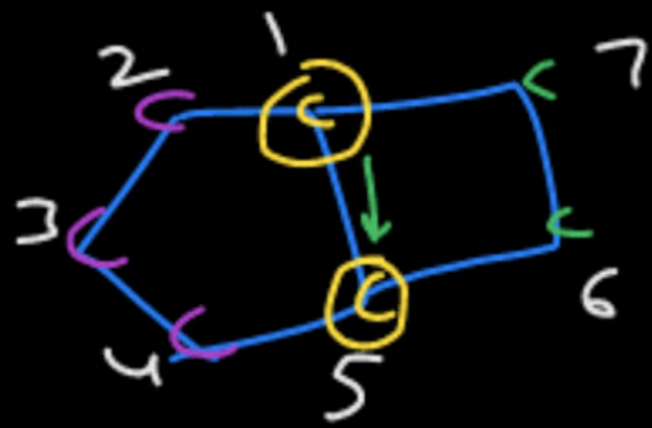


Bigada [2.2.1] hectare



Spiro [3.4] Octane

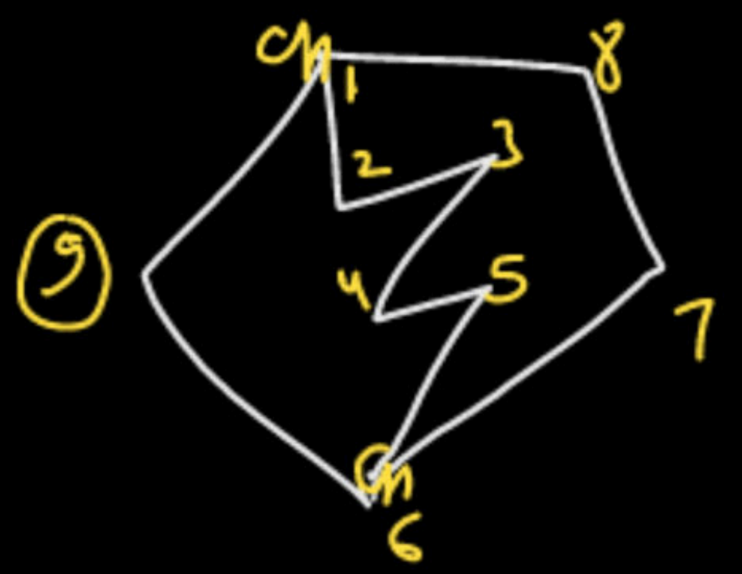
① Small bridge
② Bridge head
③ Large Bridge



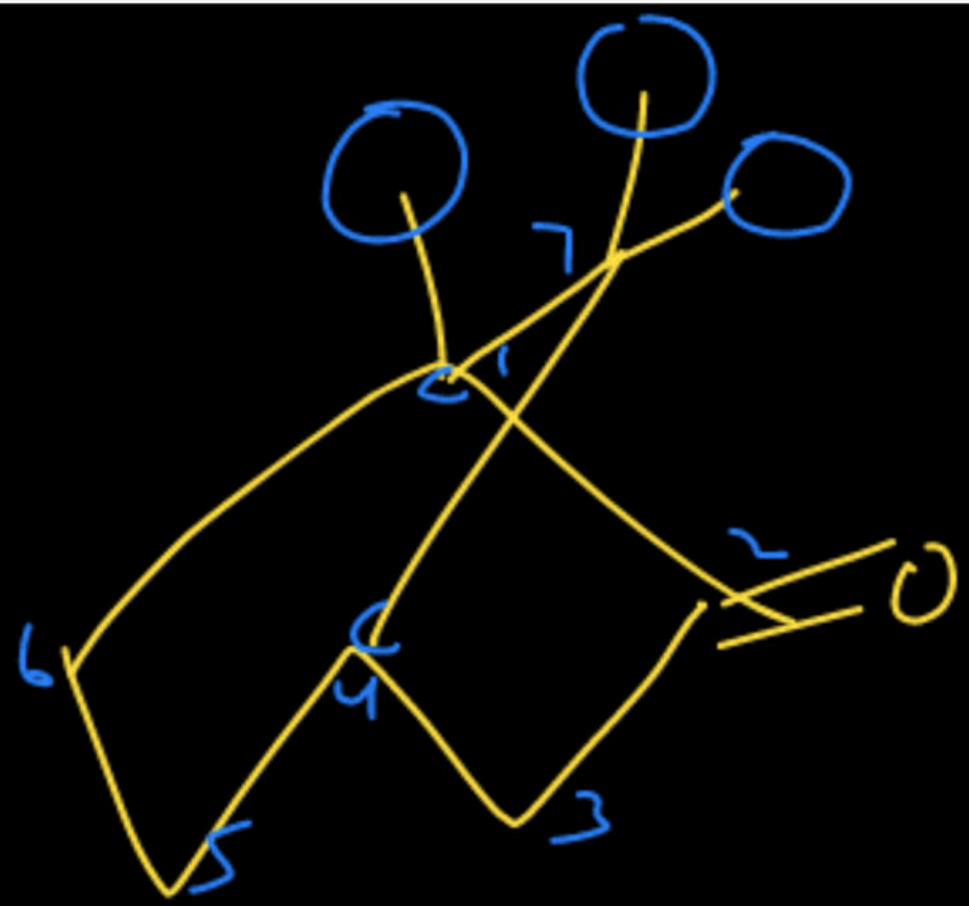
Bicyclo [3.2.0] heptane

① bridgehead
② Large Bridge
③ Bridgehead
④ Small Bridge
⑤ Smallest bridge

Spiro [2.3] hexane



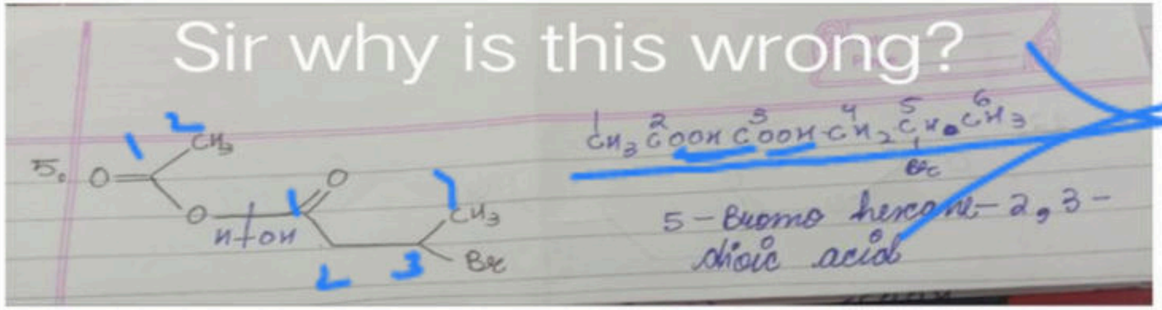
Bicyclo [4.2.1] nonane

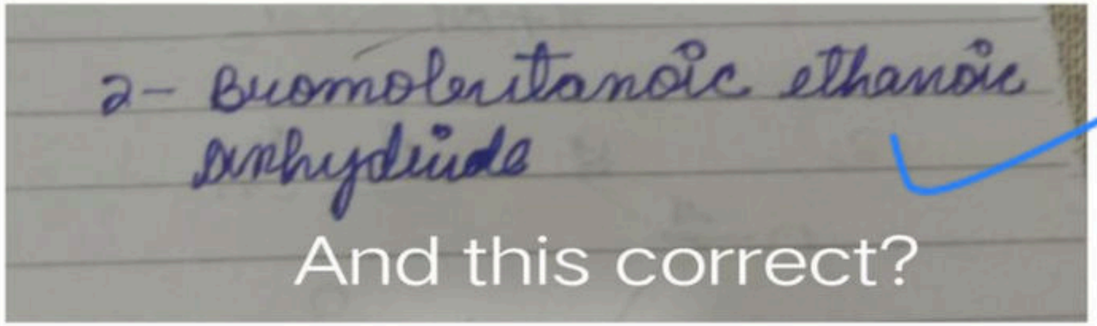


Camphor

1,7,7- trimethyl Bicyclo [2.2.1] heptan -2- one

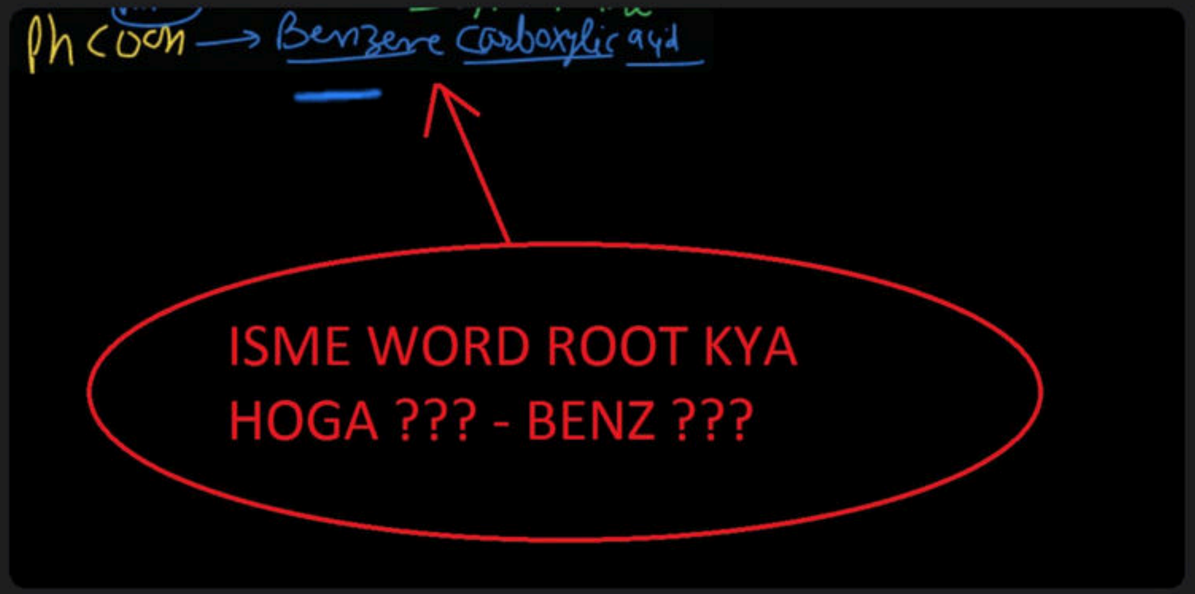
Question
from Vanshika Saraf





Question

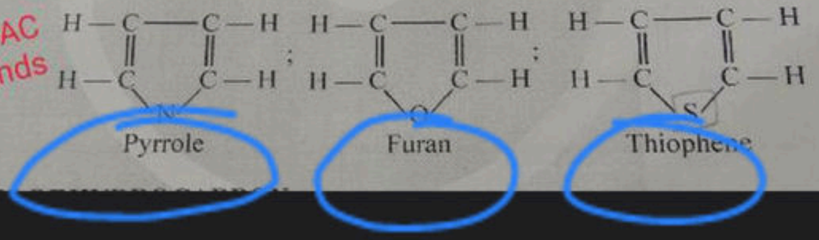
from Himang Garg



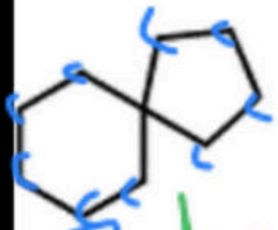
Question

from Vanshika Saraf

Sir please tell IUPAC of these compounds



1

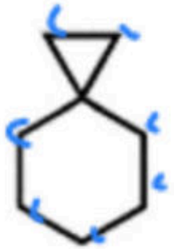


Spiro [4.5] decane

2

Spiro [3.4] octane

3

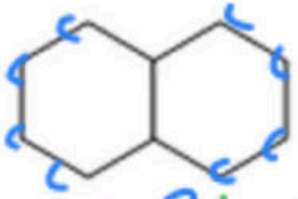


Spiro [2.5] Octan

4

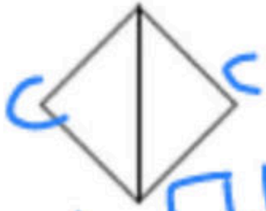
Bicyclo [3.2.1] Heptane

5



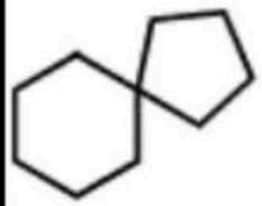
Bicyclo [4.4.0] decane

6



Bicyclo [1.1.0] Butane

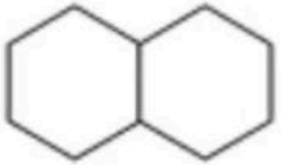
A 4
B 7
C 8
D 9
E 10



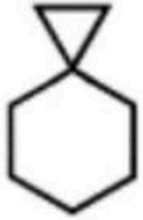
spiro [5.4] decane

Bicyclo [2.2.1] heptane

spiro [4.3] octane

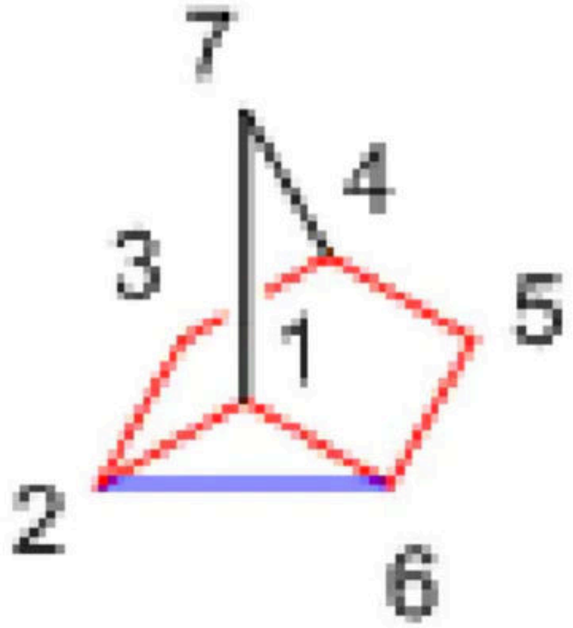


Bicyclo[4.4.0] decane

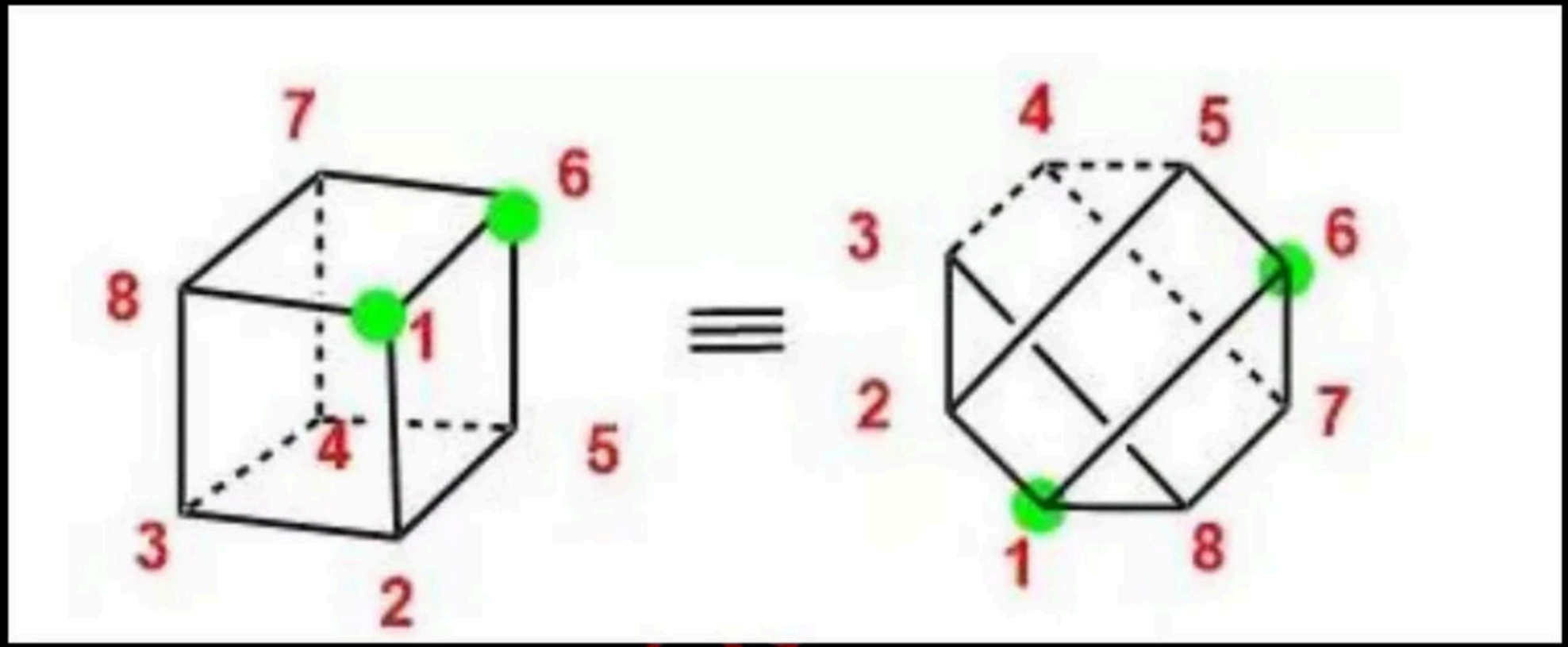


spiro [5.2] octane

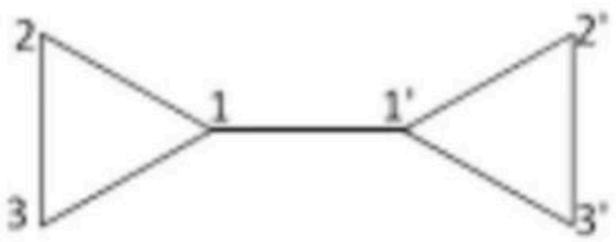
Bicyclo[1.1.0] butane



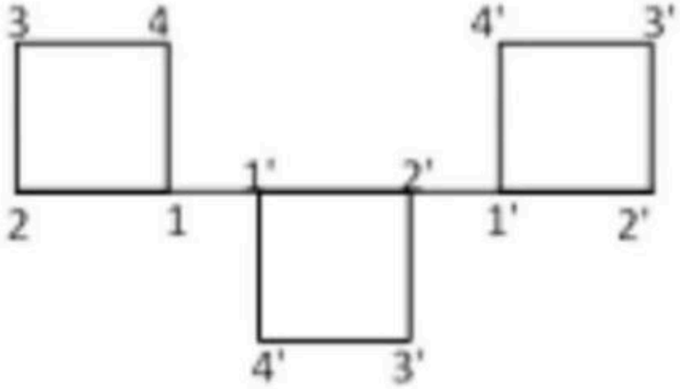
tricyclo[2.2.1.$0^{2,6}$]heptane



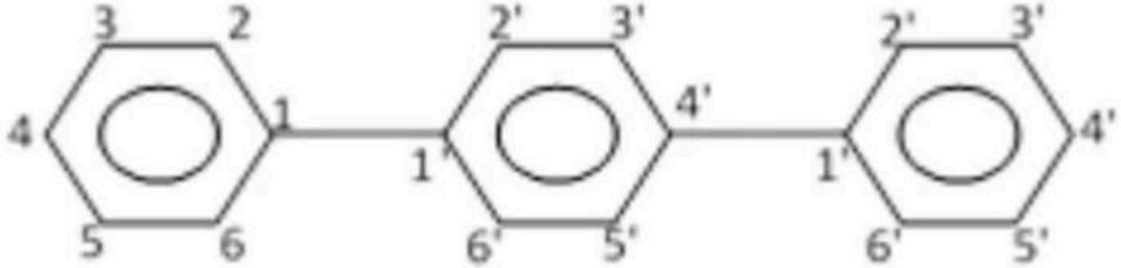
$$pentacyclo[4.2.0.0^{2,5}.0^{3,8}.0^{4,7}]octane.$$



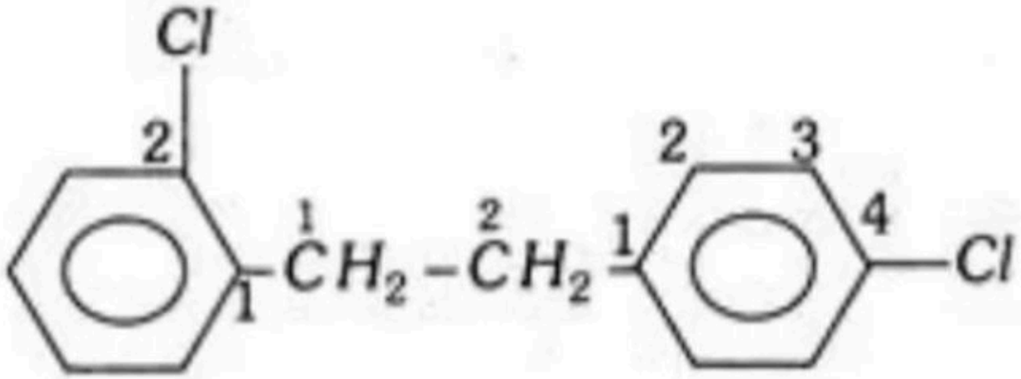
1, 1'-Bicyclopropane



1, 1', 2', 1''-Tercyclobutane



1, 1', 4', 1''-Terphenyl



1-(2-chlorolphenyl)-2-(4-chlorophenyl) ethane

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Take Care
And
Stay at home....