التماكب الفراغي و اليدوية في المركبات الحلقية

STEREOISOMERISM AND CHIRALITY IN SUBSTITUTED CYCLOALKANE

1

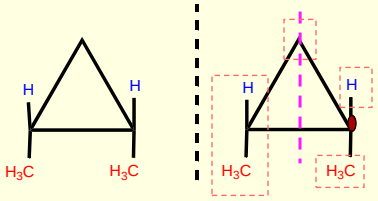
1- البروبان الحلقي Cyclopropane

2

1,2- dimethylcyclopropane

Cis

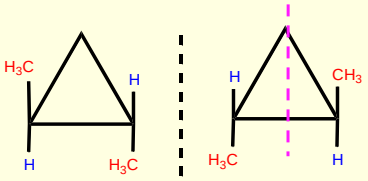
غير نشط ضوئياً
لأنه يحتوي علي
مستوى تناظر



meso

Trans

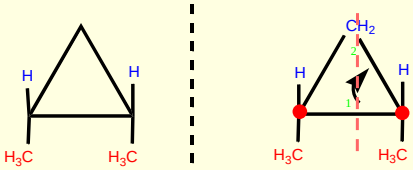
نشط ضوئياً



1S,2S

1R,2R

(Cis) 1,2-Dimethyl-cyclopropane



غير نشيط ضوئياً
–meso

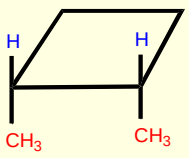
2- البيوتان الحلقي Cyclobutane

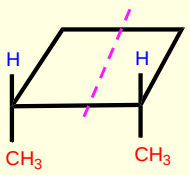
5

1,2-Dimethyl-cyclobutane

Cis

غير نشط ضوئياً
لأنه يحتوي علي
مستوى تناظر

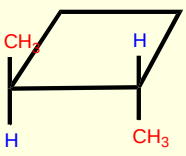


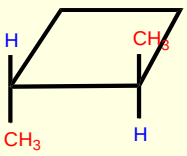


meso

trans

نشط ضوئياً



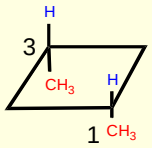


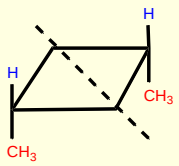
6

1,3-Dimethyl-cyclobutane

Cis

غير نشط ضوئياً
لأنه يحتوي علي
مستوى تناظر

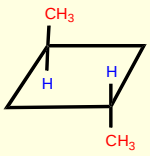


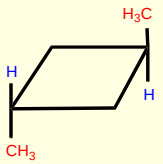


meso

trans

نشط ضوئياً



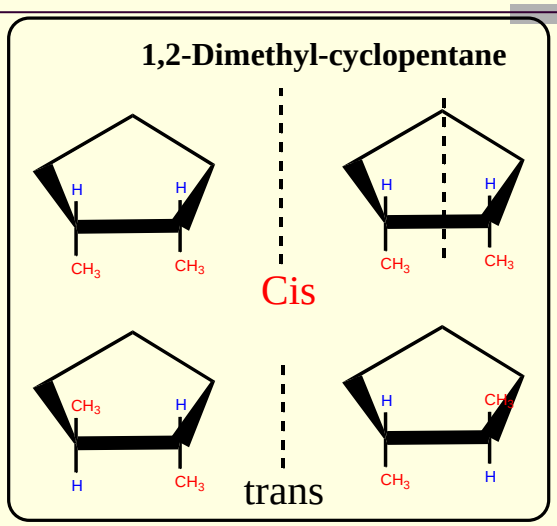


7

3- البنتان الحلقي Cyclopentane

8

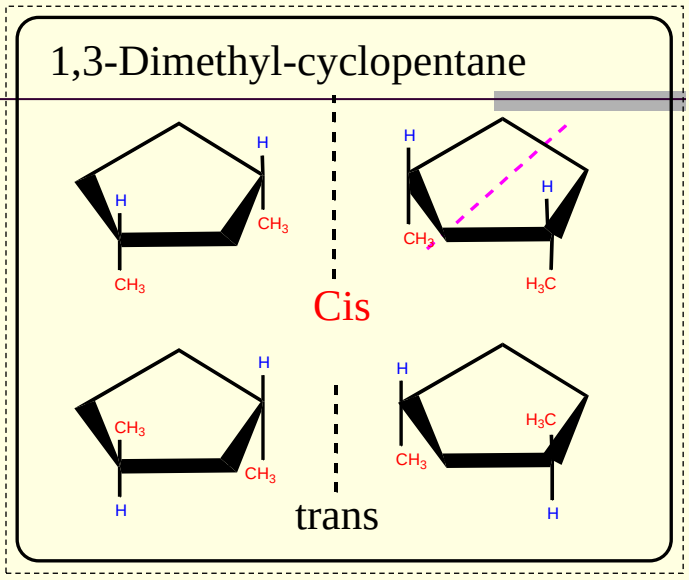
1,2-Dimethyl Cyclopentane



غير نشيط ضوئياً
–meso

نشط ضوئياً

9



غير نشط ضوئياً
لأنه يحتوي علي
مستوى تناظر

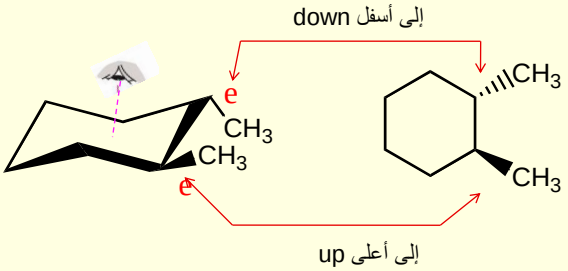
نشط ضوئياً

10

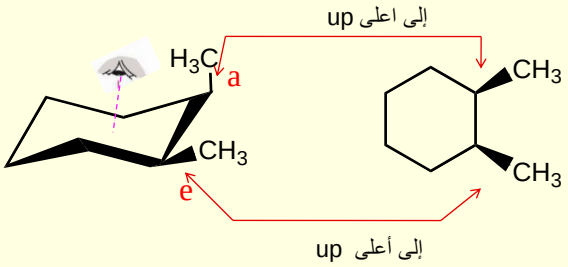
4- الهكسان الحلقي Cyclohexane

الهكسان الحلقي Cyclohexane

Trans – 1,2- dimethylcyclohexane

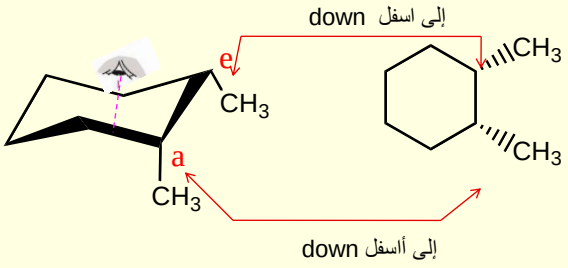


Cyclohexane الهكسان الحلقي

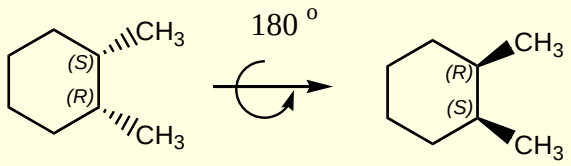


cis – 1,2- dimethylcyclohexane

cis – 1,2- dimethylcyclohexane



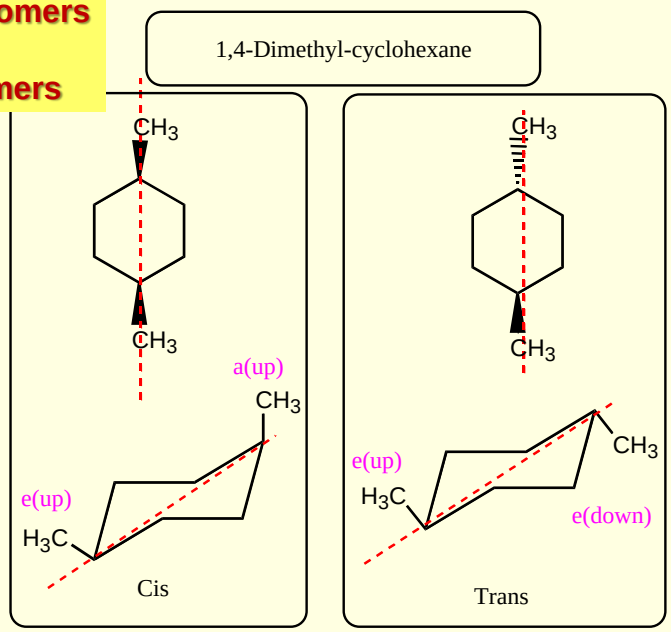
لا يخضع لمسقط فيشر يجوز الدوران في أي اتجاة و يجوز ان نخرج خارج الورقة و نديرها من فوقها



cis – 1,2- dimethylcyclohexane

15

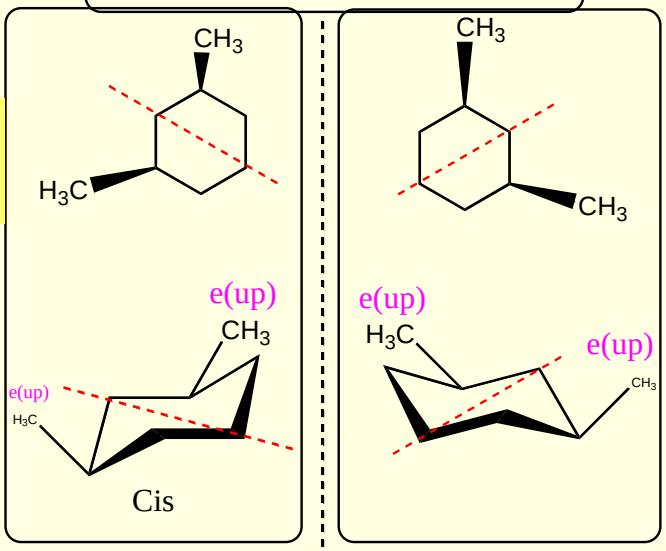
Cis & trans is Diastereomers Not Enantiomers



16

" meso "1,3-Dimethyl-cyclohexane

متطابقان
Cis
Meso



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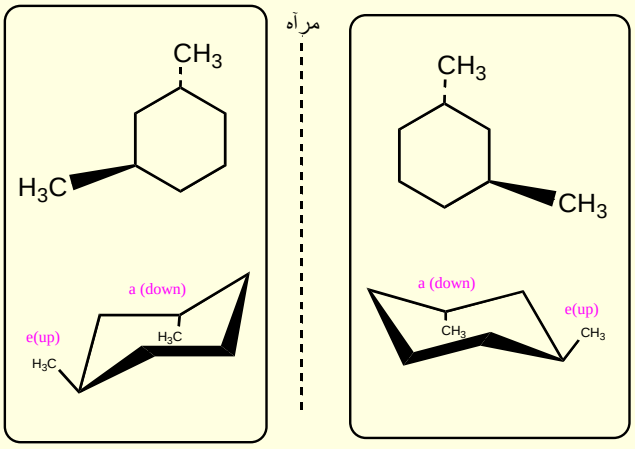
Cyclohexane الهكسان الحلقي

Trans 1,3-Dimethyl-cyclohexane

ليس له
مستوى
تناظر

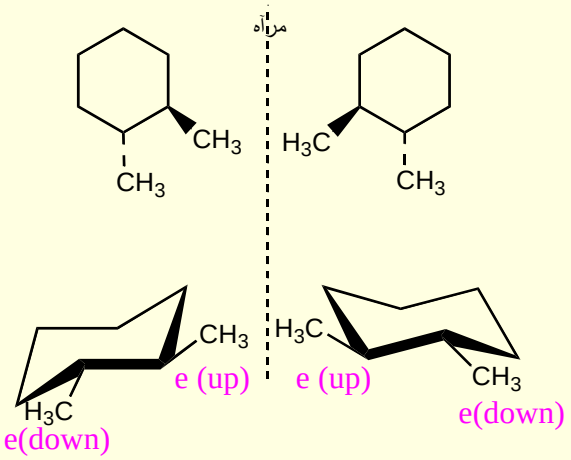
مرآه



Enantiomers

18

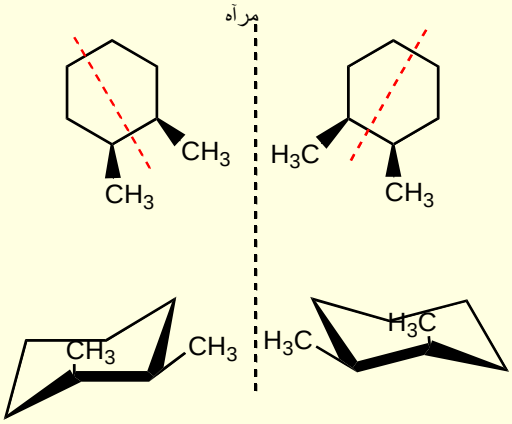
Trans 1,2-Dimethyl-cyclohexane



Enantiomers

19

Cis 1,2-Dimethyl-cyclohexane



Enantiomers

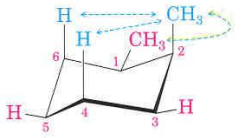
20

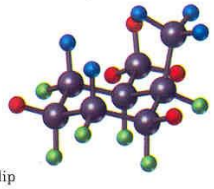
Disubstituted Cyclohexanes

Disubstituted Cyclohexanes

***cis*-1,2-Dimethylcyclohexane**

One gauche interaction (3.8 kJ/mol)
Two CH_3–H diaxial interactions (7.6 kJ/mol)
Total strain: 3.8 + 7.6 = 11.4 kJ/mol

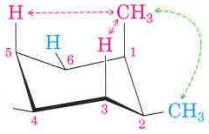


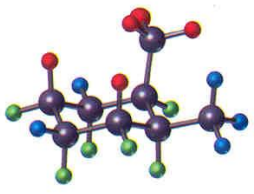


Ring-flip

One gauche interaction (3.8 kJ/mol)
Two CH_3–H diaxial interactions (7.6 kJ/mol)
Total strain: 3.8 + 7.6 = 11.4 kJ/mol

0.9 + 1.8 = 2.7 kcal/mol





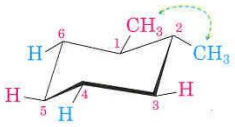
Disubstituted Cyclohexanes

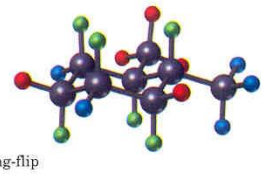
***trans*-1,2-Dimethylcyclohexane**

One gauche interaction (3.8 kJ/mol)

0.9 kcal/mol

Relative 0.0 kcal/mol





Ring-flip

Four CH_3–H diaxial interactions (15.2 kJ/mol)

3.6 kcal/mol

Relative 2.7 kcal/mol