The image features two sets of ball-and-stick molecular models. The top set shows a cyclohexane ring with one double bond highlighted in blue, representing cyclohexene. The bottom set shows a cyclohexane ring with one double bond highlighted in red, also representing cyclohexene. The text '第五章 环烷烃' is centered in the middle of the image.

第五章 环烷烃



1. 环烷烃的分类

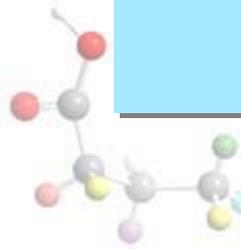
环烷烃

单环烷烃-----只含一个环的环烷烃

桥环烷烃-----共用两个或两个以上碳原子的多环烷烃

螺环烷烃-----单环之间共用一个碳原子的多环烷烃

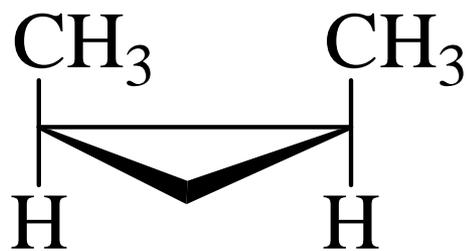
集合环烷烃-----环与环之间以单键直接相连的多环烷烃



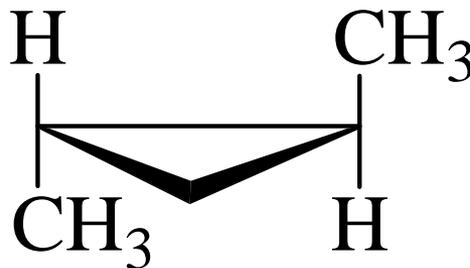


2. 环烷烃的异构和命名

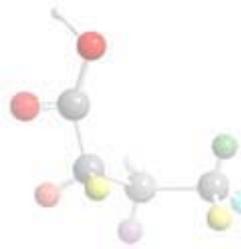
- 碳架异构、顺反异构、旋光异构、构象异构
- 顺反异构：由于成环原子之间的单键不能自由旋转而引起。两个取代基在环平面同侧为顺式，不同侧为反式。



cis



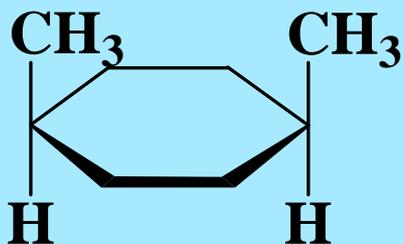
trans



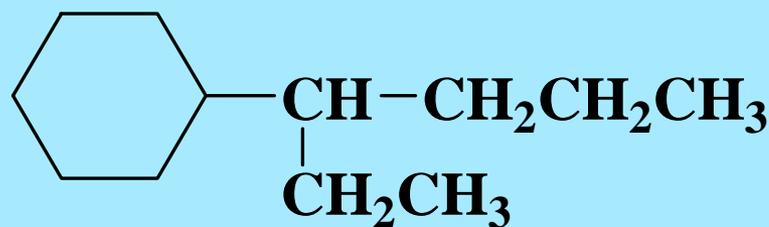


命名

- (a) 没有取代基: 在相应烷烃名称前加“环”。
- (b) 有取代基: 取代基简单时以环为母体, 取代基复杂时环做为取代基。



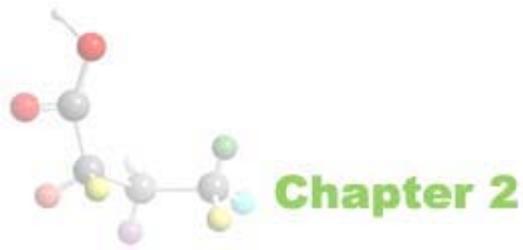
顺-1,4-二甲基环己烷
cis-1,4-Dimethylcyclohexane



3-环己基己烷
3-Cyclohexylhexane



3. 环烷烃的物理性质（自学）



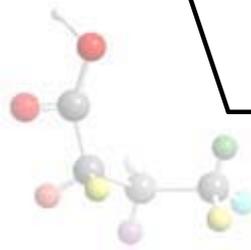
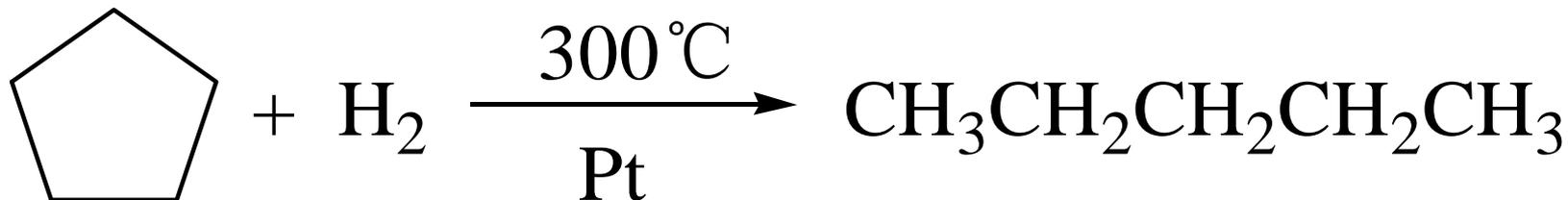
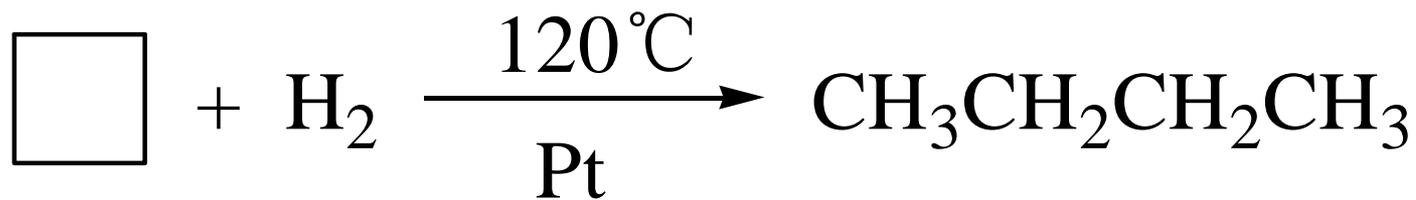
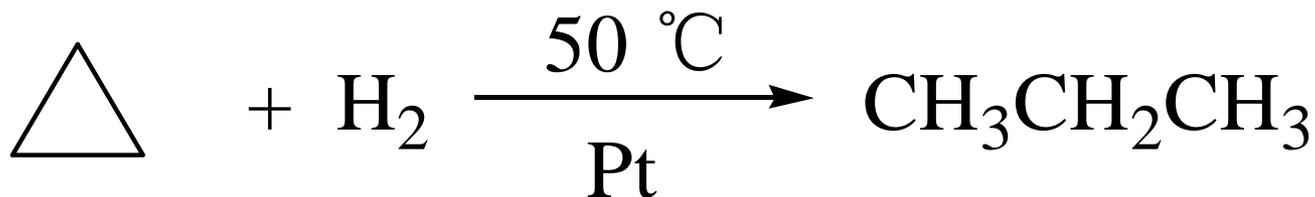


4 环烷烃的化学性质



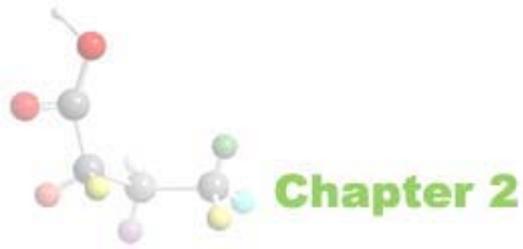
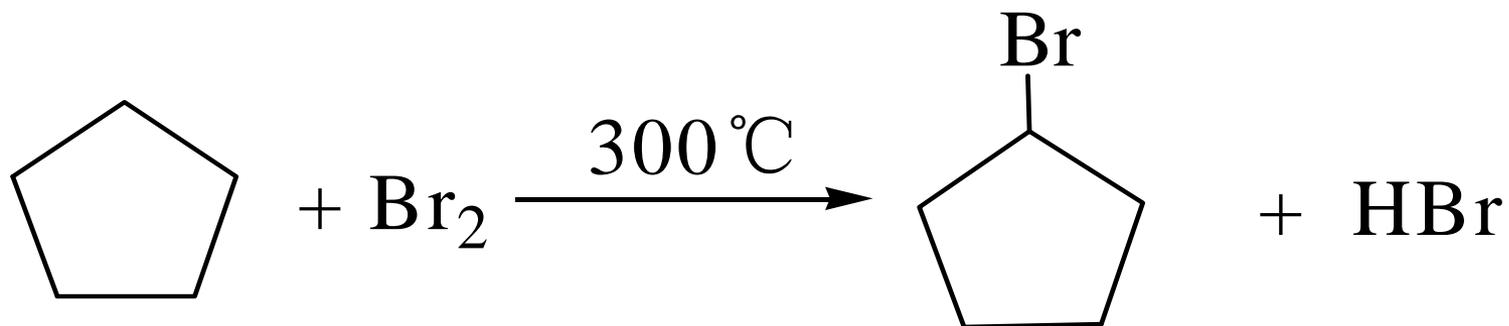
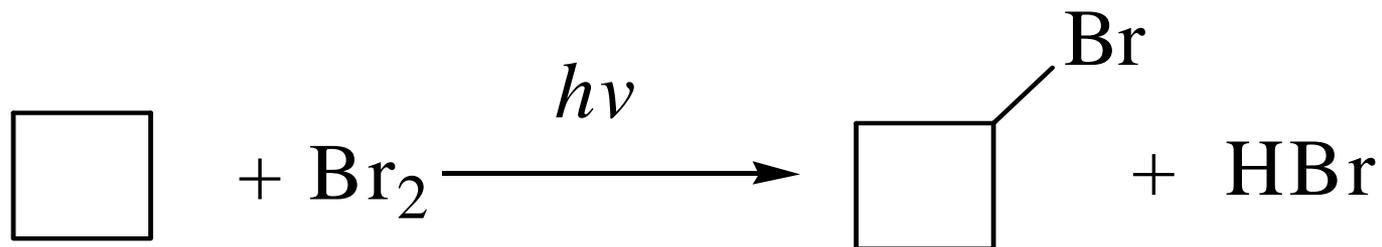
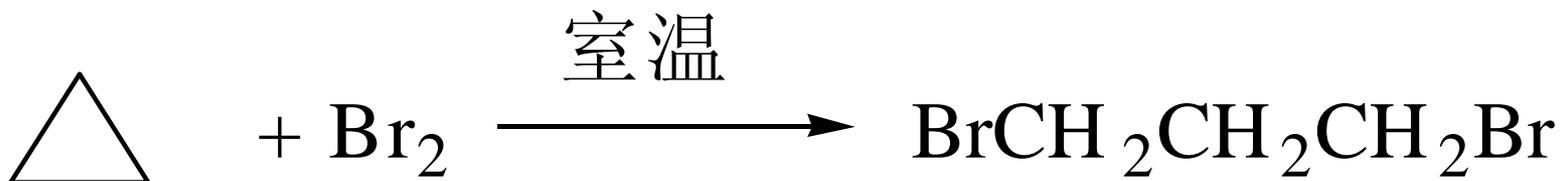


(1) 加氢



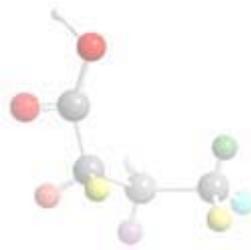
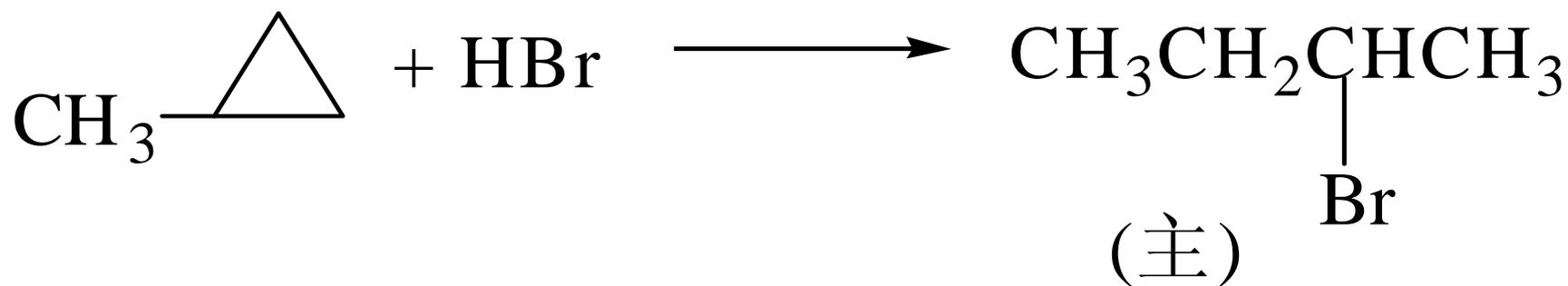
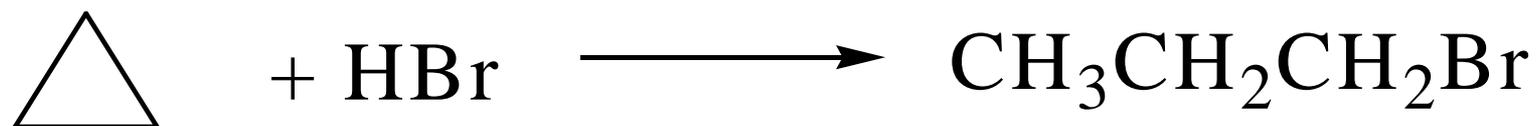


(2) 加卤素





(3) 加卤化氢





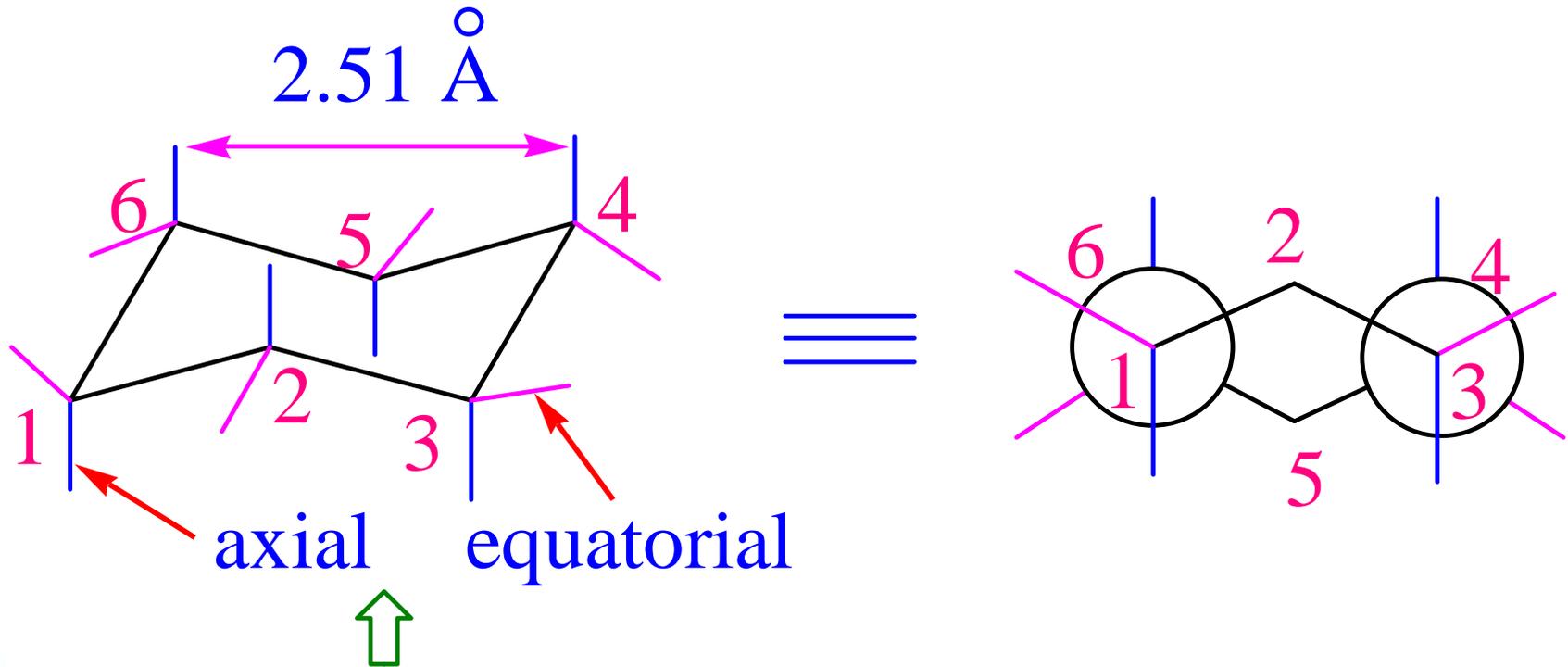
5. 环烷烃的构象





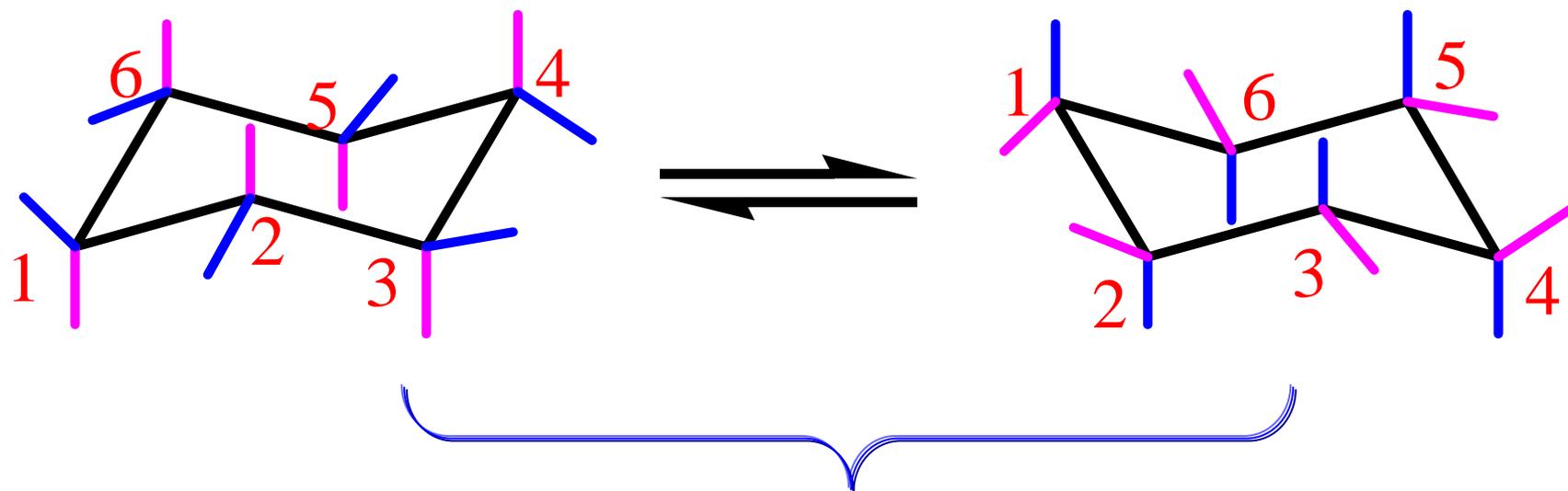
(1) 环己烷的构象

(A) 椅式构象

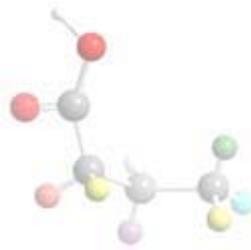




两种椅式构象

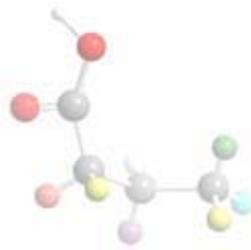
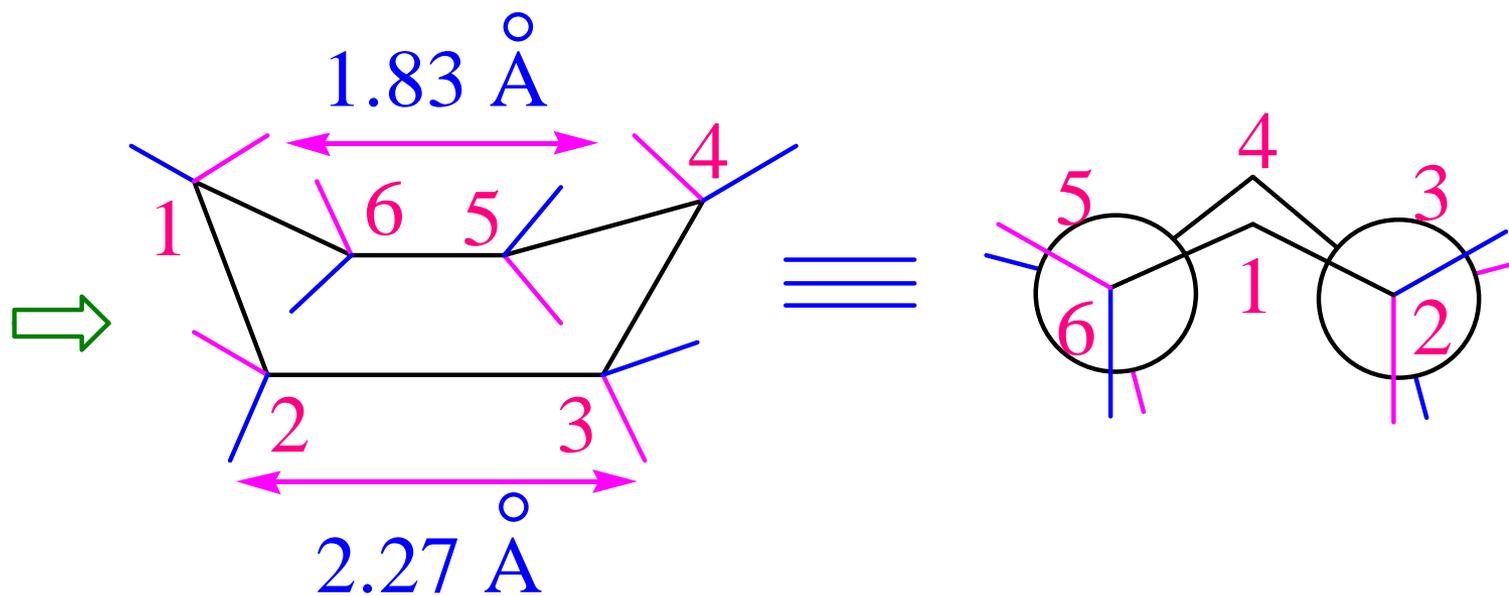


构象转换体



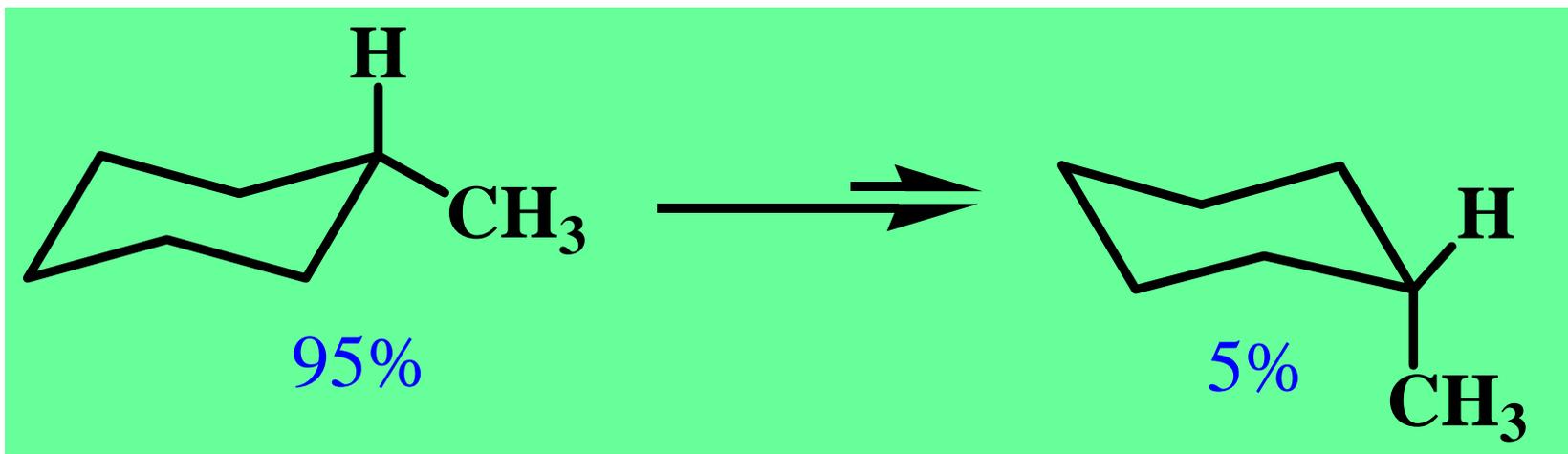


(B) 船式构象





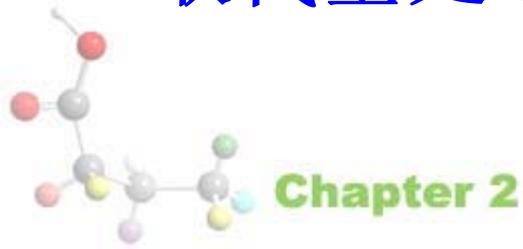
(2) 一取代环己烷的构象



构象转换体

能量差 = **7.6 kJ / mol**

取代基处于 e -键的构象是优势构象



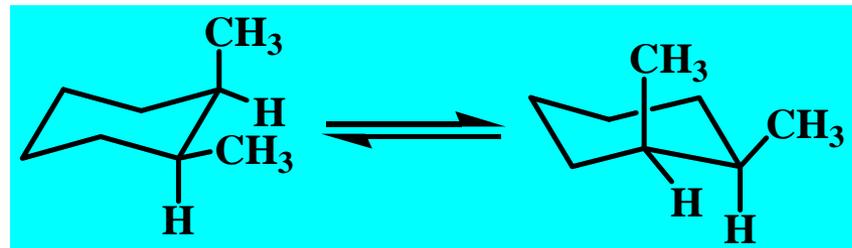
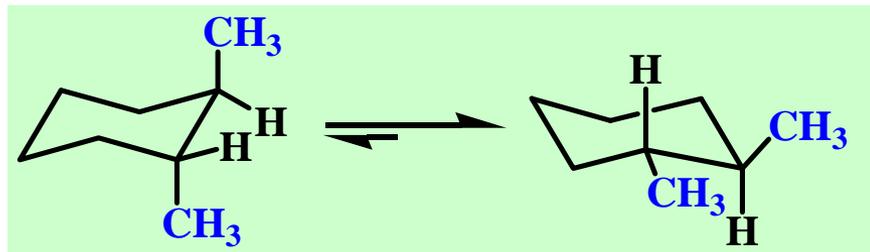


3. 二取代环己烷的构象

➤ 平面式表示法



➤ 构象式表示法





4. 两个不同取代基的环己烷衍生物

