

同步训练 三

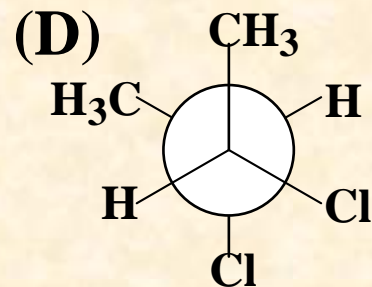
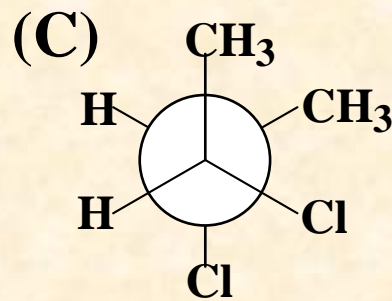
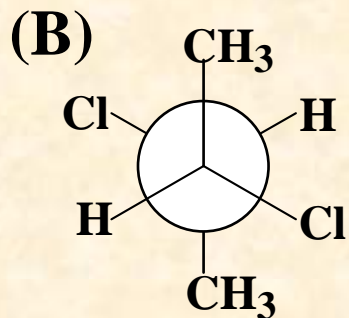
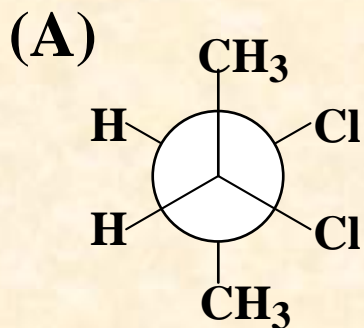
对映异构

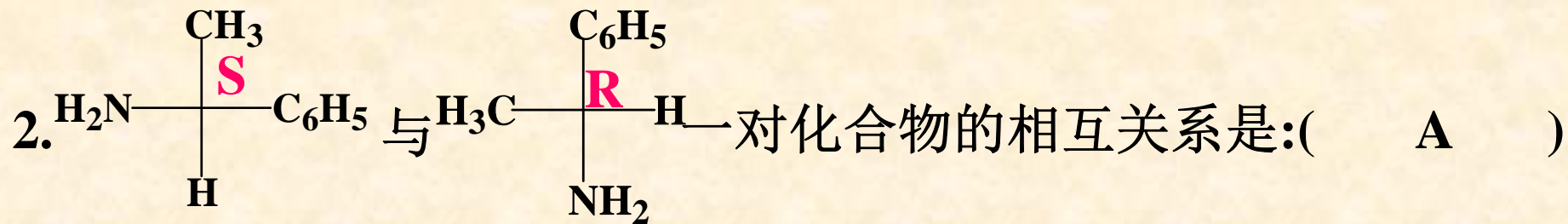
一、是非题:

1. 化合物A, B的旋光度分别是 $+20^\circ$ 和 $+30^\circ$, 则B的旋光性一定比A大。 (×)
2. 分子中有手性碳的化合物一定有旋光性。 (×)
3. 内消旋的分子没有手性。 (√)
4. 构象异构体之间是同一化合物的关系。 (√)

二、选择题:

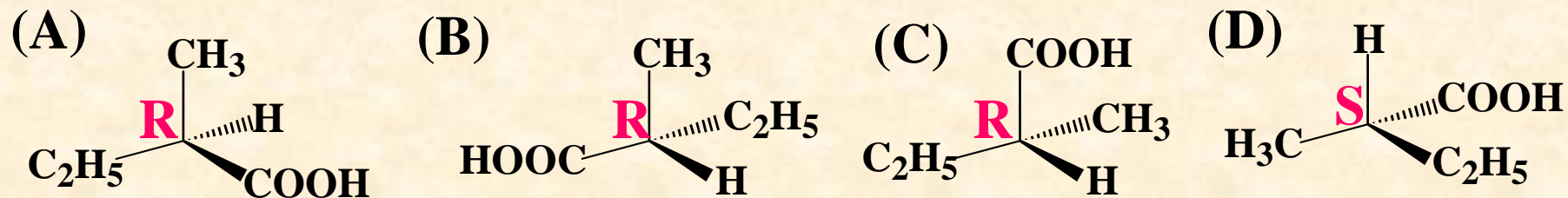
1. 内消旋体-2, 3-二氯丁烷的优势构象的Newman投影式是: (**B**)





(A)对映异构体 (B)非对映异构体 (C)相同化合物 (D)不同化合物

3. 下列化合物中与(R)-2-甲基丁酸不相同的化合物是: (D)



4. 乙醇与二甲醚是什么异构体? (C)

(A)碳架异构 (B)位置异构 (C)官能团异构 (D)互变异构

5. 具有对映异构现象的烷烃, 起码最少碳原子数是多少?(B)

(A) 6

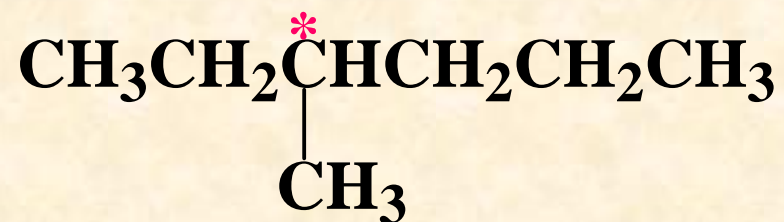
(B) 7

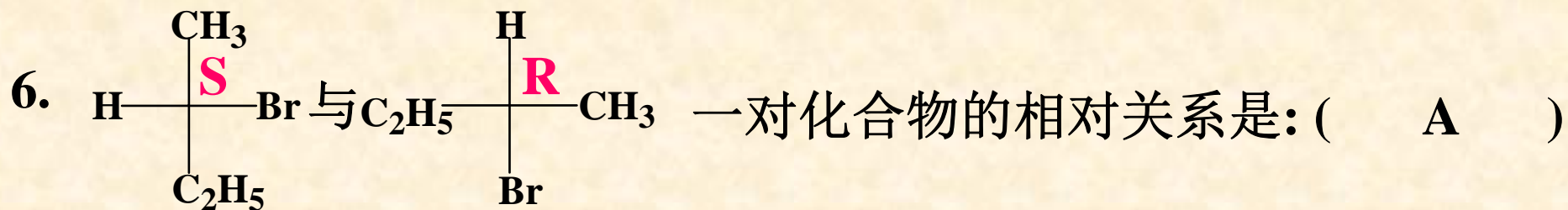
(C) 8

(D) 9



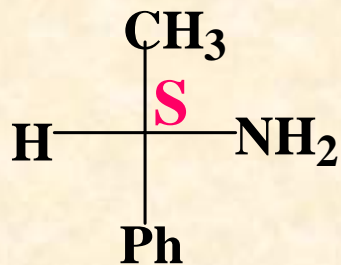
具有对映异构现象的最少碳原子数烷烃:



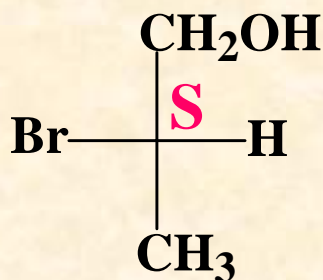


(A)对映异构 (B)非对映异构 (C)相同化合物 (D)不同化合物

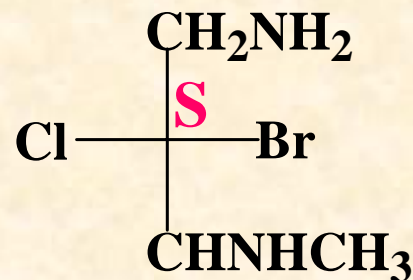
7. 指出下列构型的正确命名: (**C**)



①



②



③

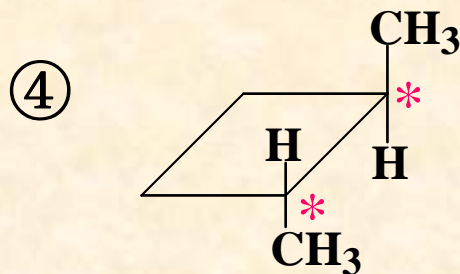
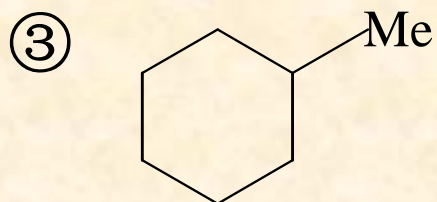
(A) ① R ② R ③ S

(B) ① R ② S ③ S

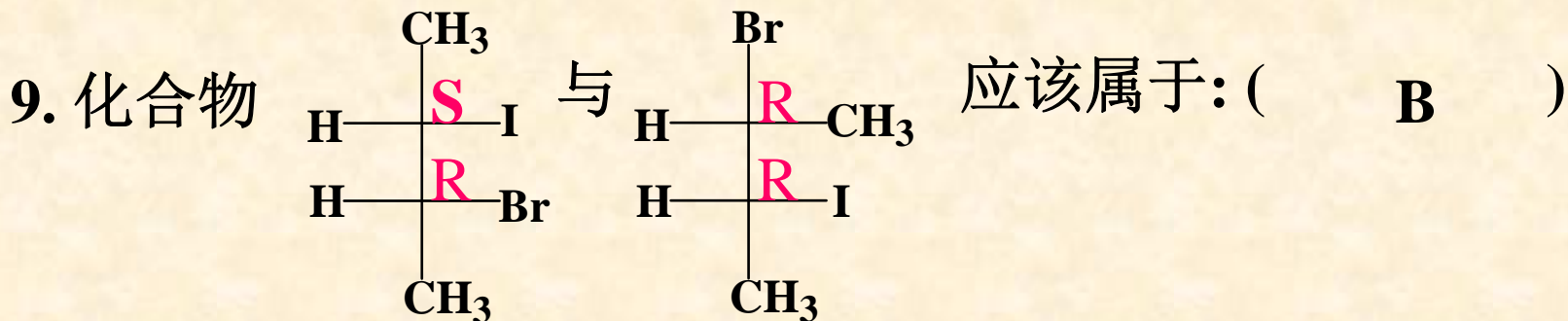
(C) ① S ② S ③ S

(D) ① R ② R ③ R

8. 下列化合物具有手性碳原子的是：(C)



(A) ①② (B) ①③ (C) ①④ (D) ②④



(A) 对映体 (B) 非对映体 (C) 同一化合物 (D) 顺反异构体

10. 下列化合物中哪一种可能有对映异构体: (B)



11. 含有两个相同手性碳原子的A-A型化合物有几种旋光异构体?(C)

(A) 2种 (B) 4种 (C) 3种 (D) 5种

12. 1848年, 首先研究酒石酸盐的晶体, 从而分离出旋光异构体的是谁? (A)

(A) 巴斯德(Paster, L) (B) 比奥(Biot)
(C) 勒贝尔(Laber. J. A) (D) 拜耳(Baeyer)

13. 分子式为 C_5H_{10} ，分子内含有三元环的烃类异构体应该有(D)

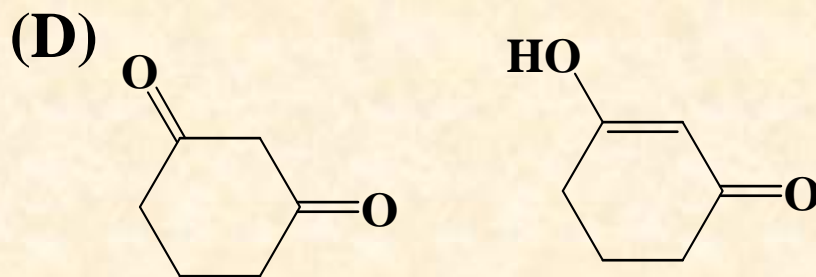
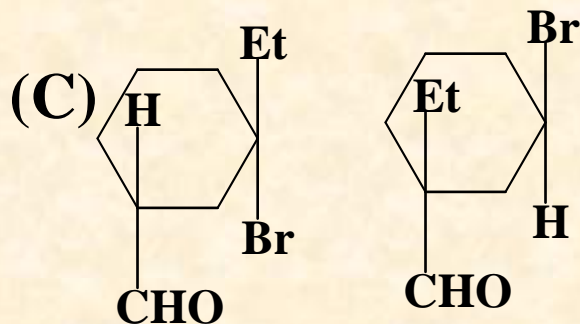
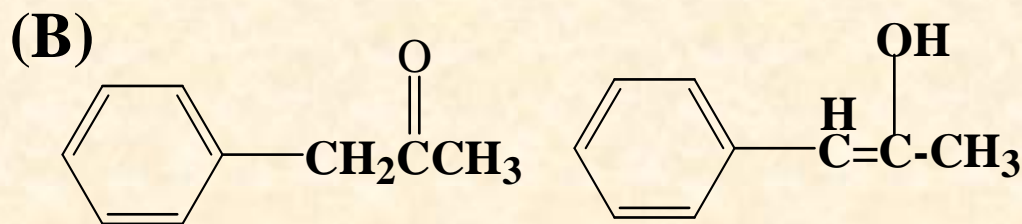
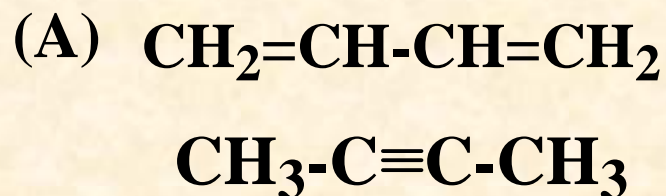
- (A) 2种 (B) 3种 (C) 4种 (D) 5种



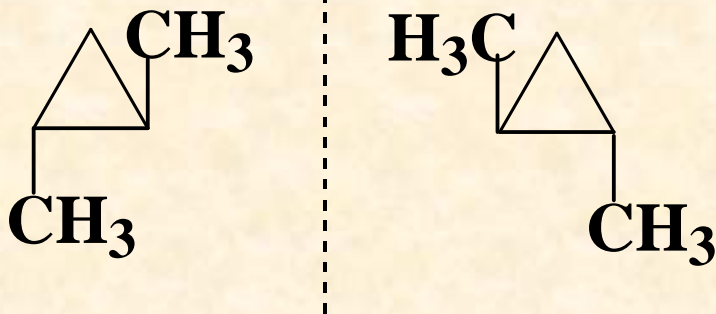
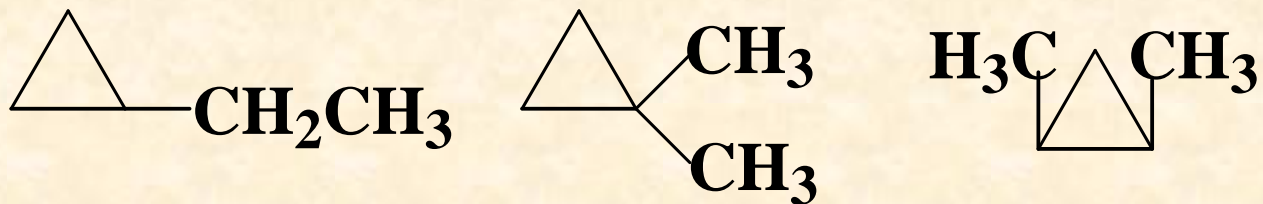
14. 1,2-二甲基环丙烷有几个立体异构体?(C)

- (A) 无立体异构体 (B) 二个(一对对映异构体)
(C) 三个(一对对映异构体和一个内消旋体)
(D) 四个(两对对映异构体)

15. 在下列各对化合物中, 互为官能团异构体的是:(A)

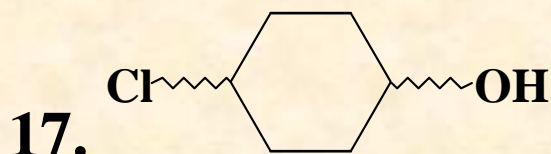


分子式为 C_5H_{10} ，分子内含有三元环的烃类异构体：



16. 将分子式为 $C_3H_6Cl_2$ 的异构体进一步氯化,有几个化合物只给出一个三氯代物?(A)

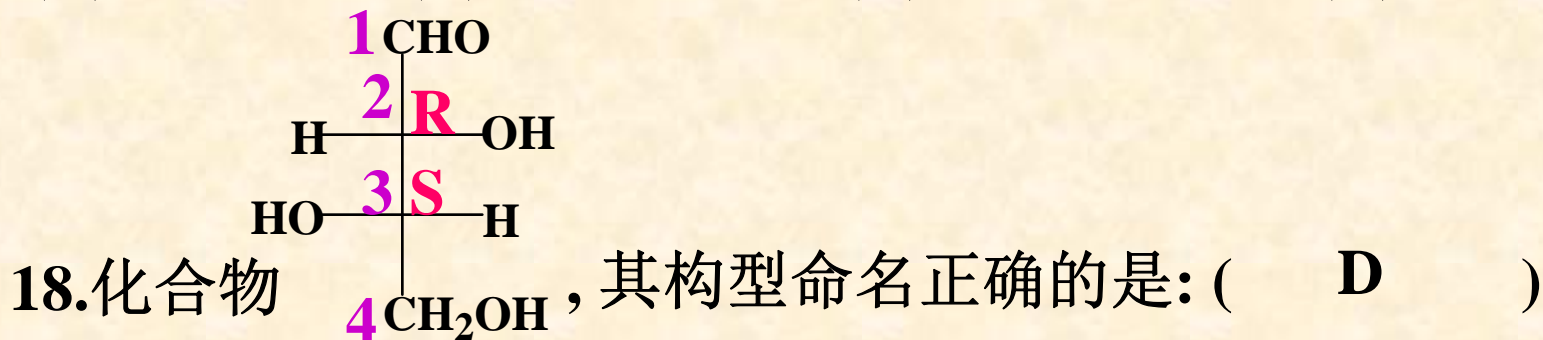
(A) 1个 (B) 2个 (C) 3个 (D) 4个



具有这种结构的4-氯环己醇,共有几个立体

异构体?(A)

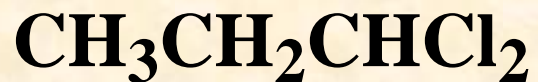
(A) 2个 (B) 3个 (C) 4个 (D) 5种



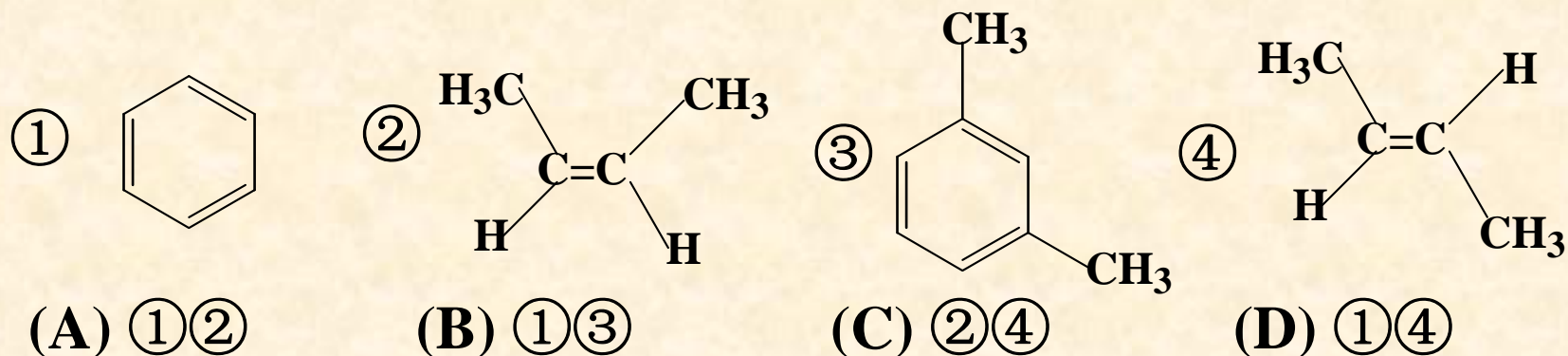
(A) 2S, 3S (B) 2R, 3R (C) 2S, 3R (D) 2R, 3S



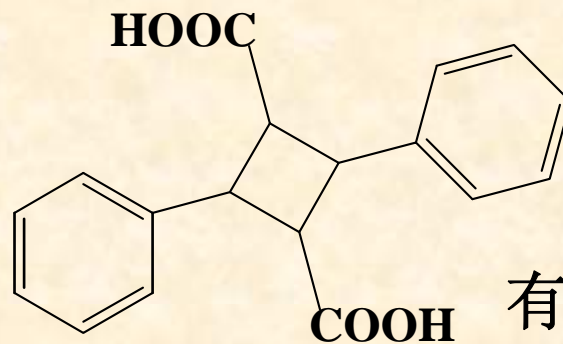
$C_3H_6Cl_2$ 的异构体:



19. 下列化合物具有对称中心的应是: (**D**)



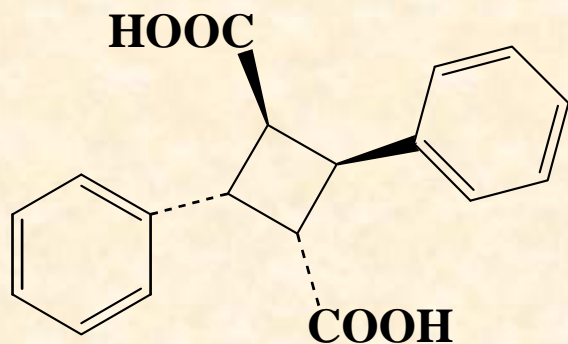
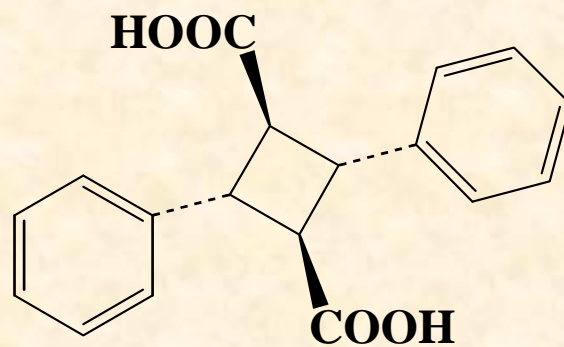
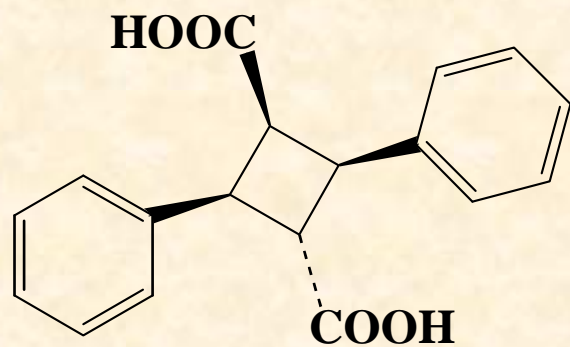
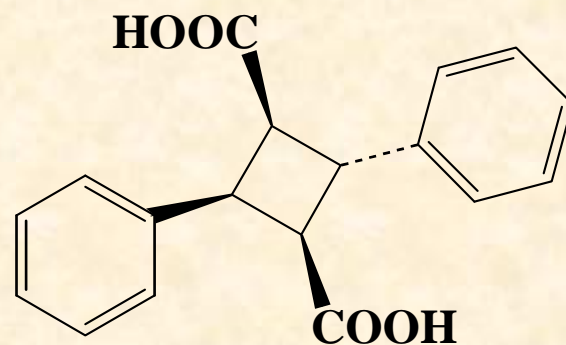
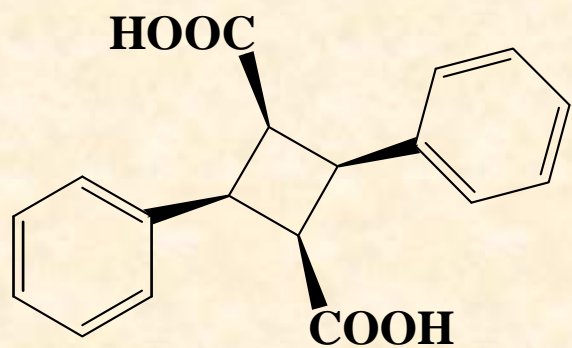
20. 2,4-二苯环丁烷-1,3-二甲酸 有几种立体异构体? (**D**)




(A) 2种 (B) 3种 (C) 4种 (D) 5种

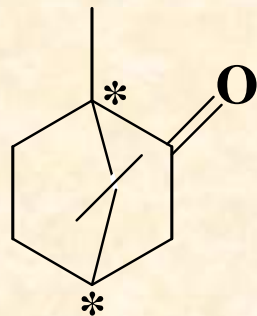
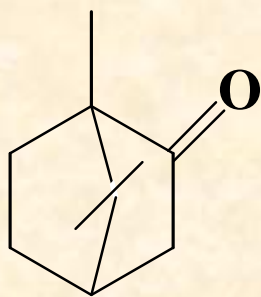


2,4-二苯环丁烷-1,3-二甲酸的立体异构体:



三、用“*”标出下列化合物结构式中的所有手性碳原子,按 2^n 公式应有几个旋光异构体?实际上有几个旋光异构体? 

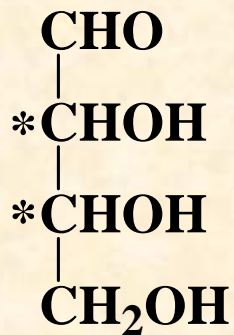
1.



$$2^n = 4$$

实际: 2

2.



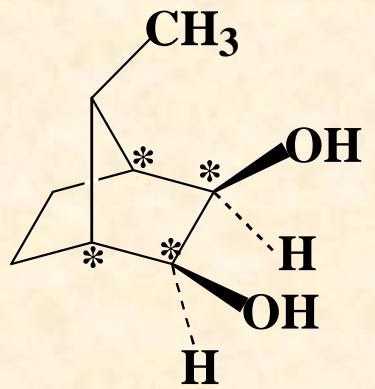
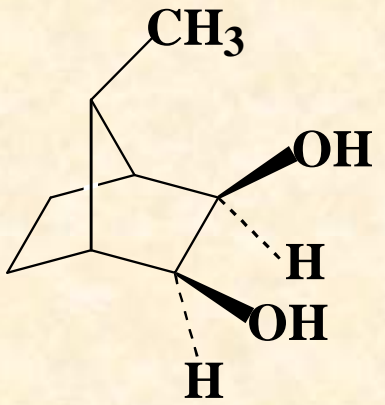
$$2^n = 4$$

实际: 4

当分子中含有 n 个不相同的不对称碳原子时，对映异构体的数目为 2^n ，它们分别组成 2^{n-1} 个外消旋体。如分子中所含的不对称碳原子有相同时，对映体的数目小于 2^n 。



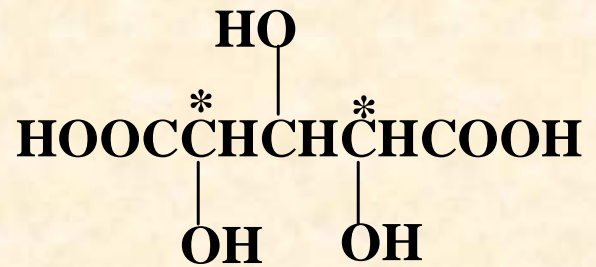
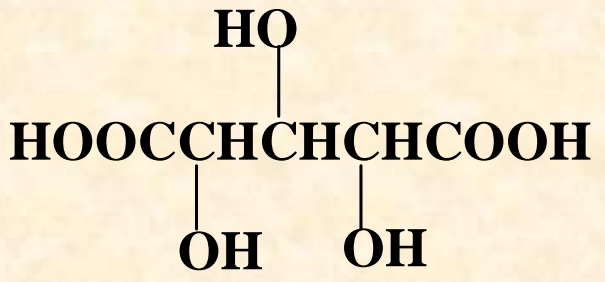
3.



$2^n = 16$

实际: 无旋光异构体

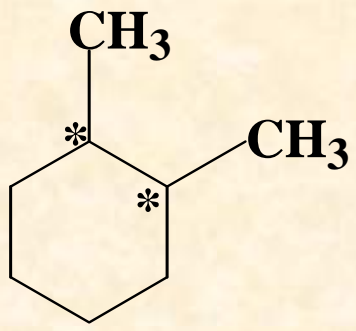
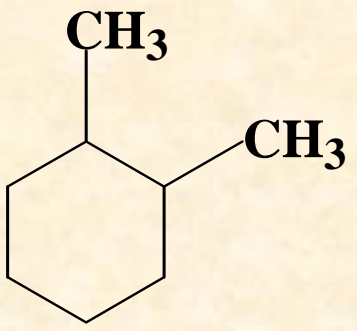
4.



$2^n = 4$

实际: 4

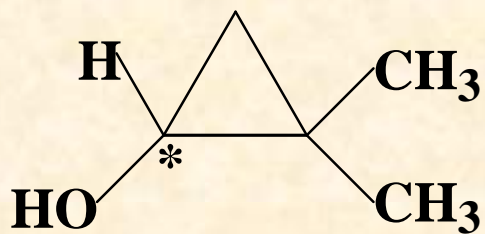
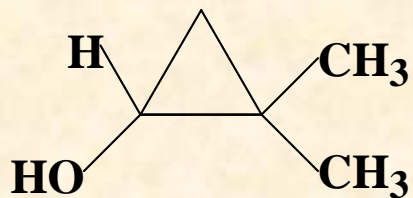
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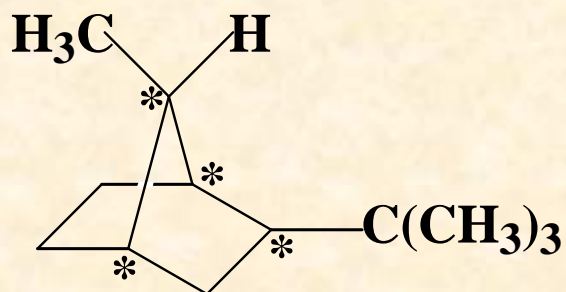
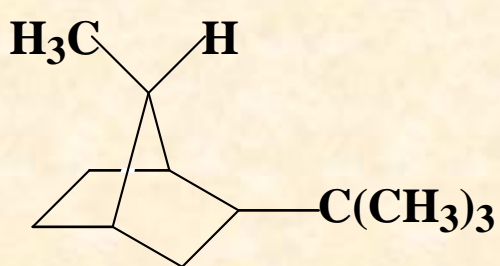
$2^n = 4$

实际: 3

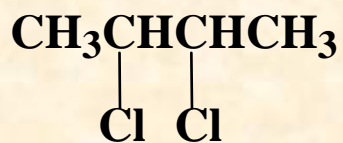
6.


 $2^n = 2$
 实际: 2

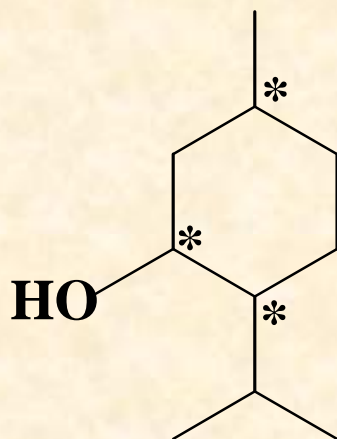
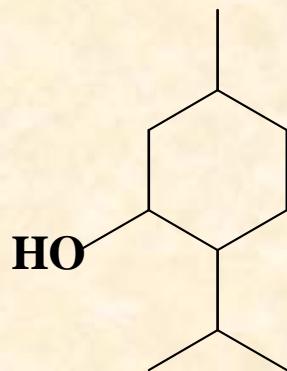
7.


 $2^n = 16$
 实际: 8

8.


 $2^n = 4$
 实际: 3

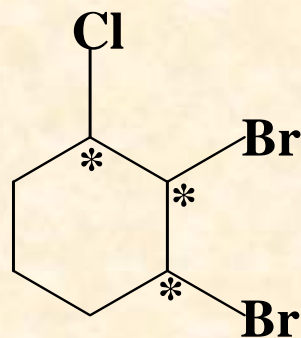
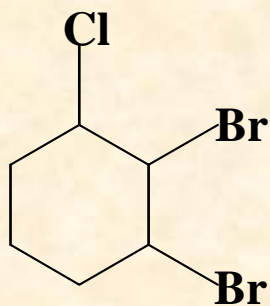
9.



$$2^n = 8$$

实际: 8

10.

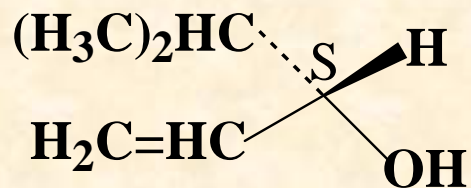
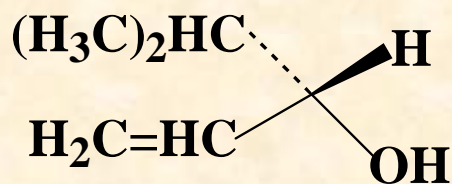


$$2^n = 8$$

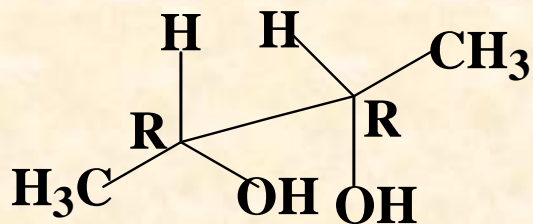
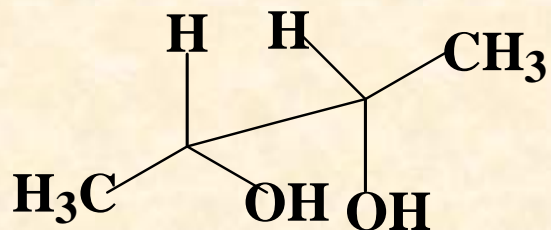
实际: 8

四、用R/S法标记下列化合物中手性碳原子的构型：

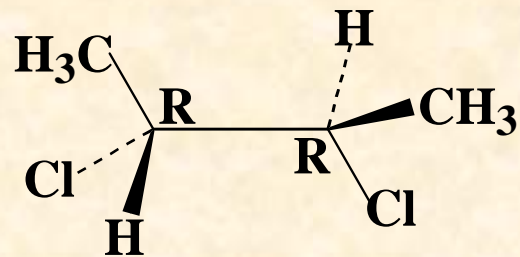
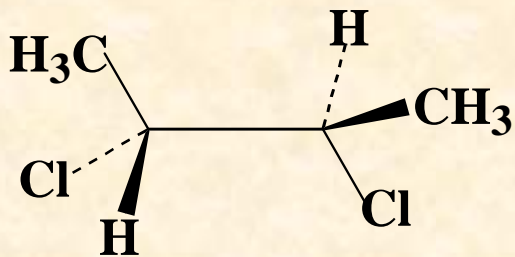
1.



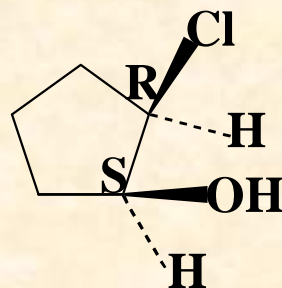
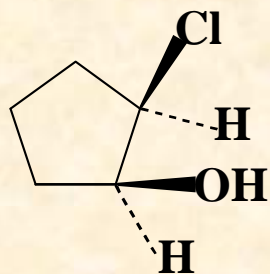
2.



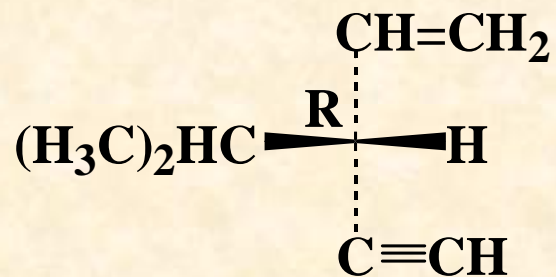
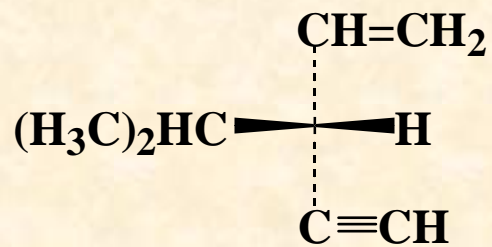
3.



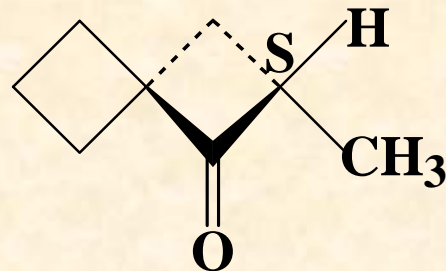
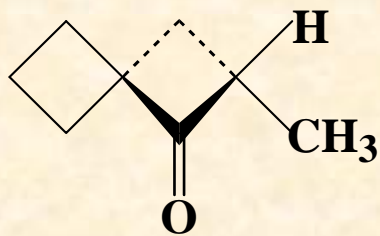
4.



5.

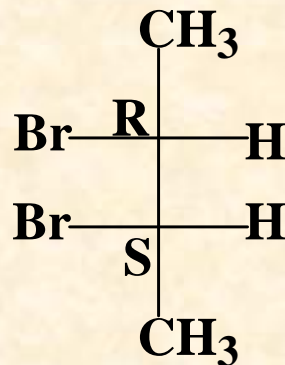


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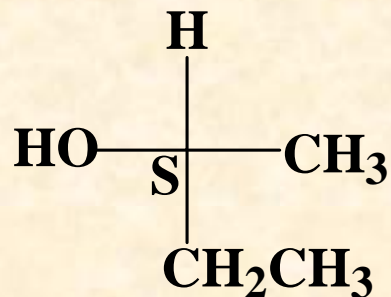
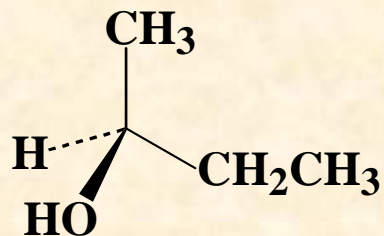


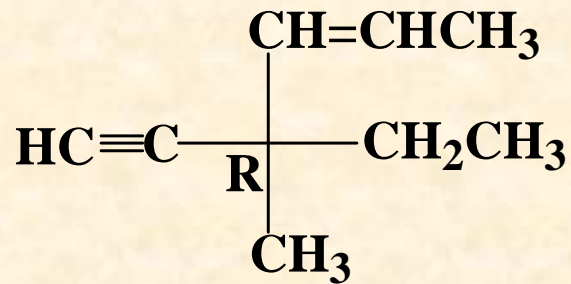
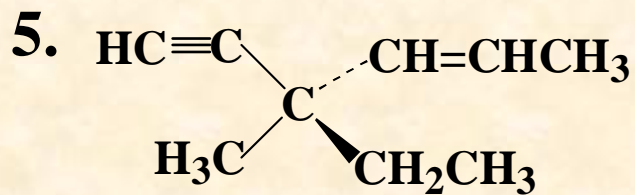
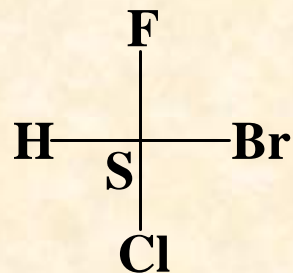
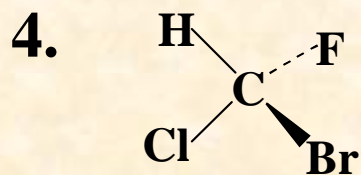
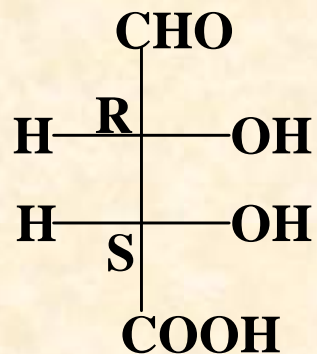
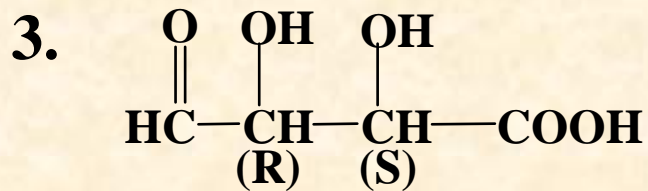
五、画出下列化合物的Fischer投影式, 指出每个手性碳的R, S构型:

1. (2R, 3S)-2, 3-二溴丁烷

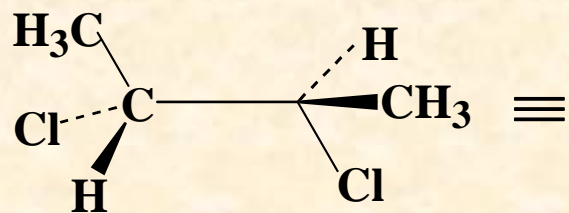


2.

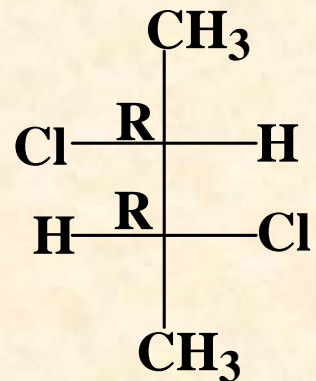
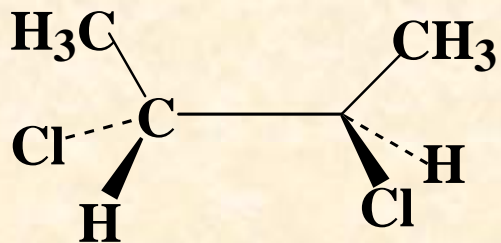




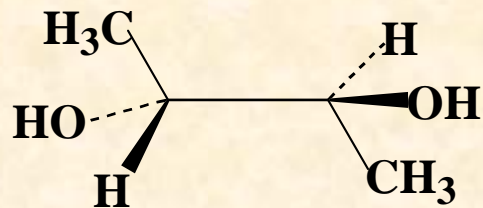
6.



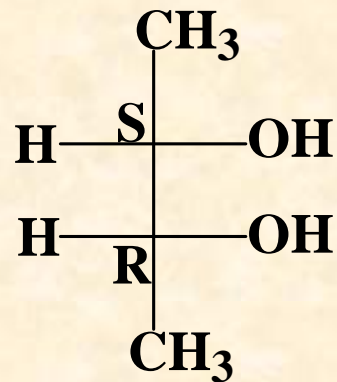
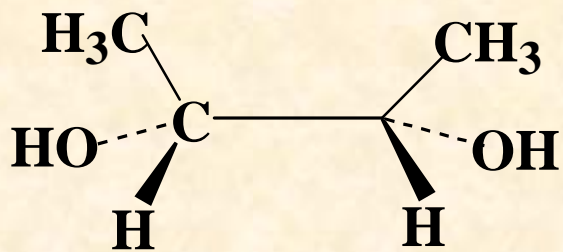
≡



7.

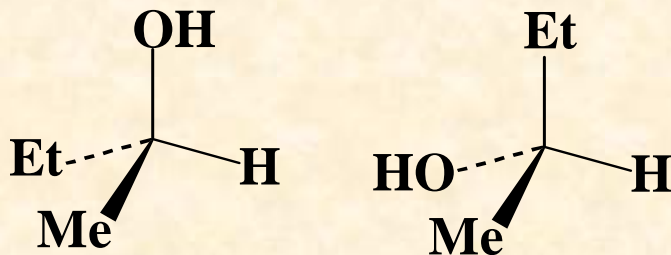


≡



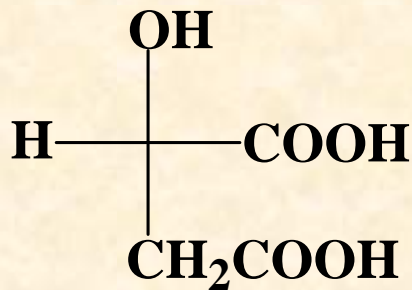
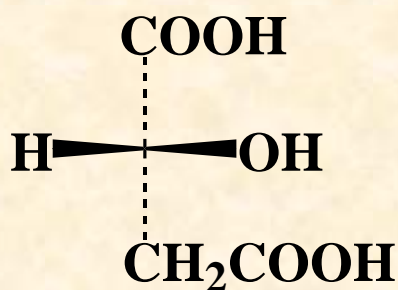
六、找出下列各组化合物间的相互关系：(对映体, 非对映体, 顺反异构体, 相同化合物或不同化合物)

1.



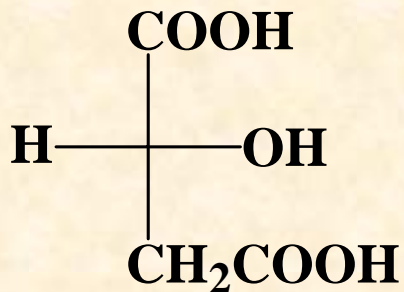
对映异构体

2.

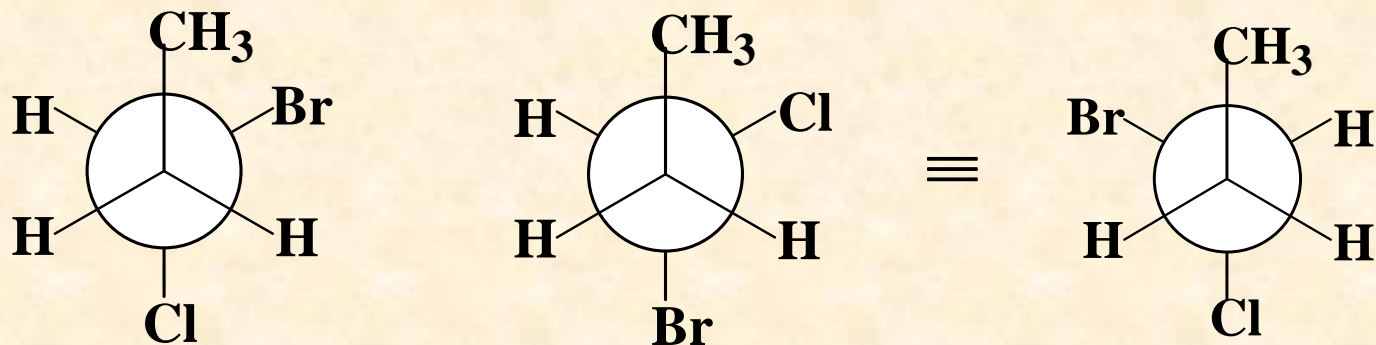


对映异构体

|||



3.



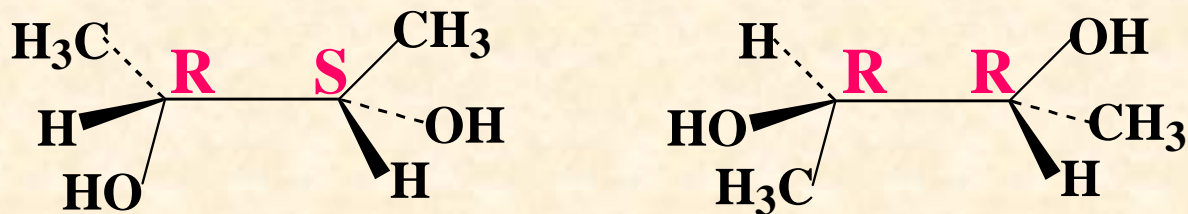
对映异构体

4.



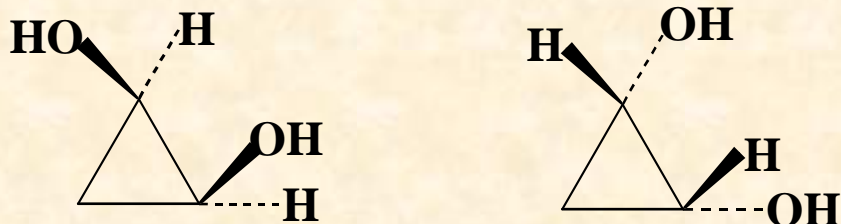
顺反异构体

5.



非对映异构体

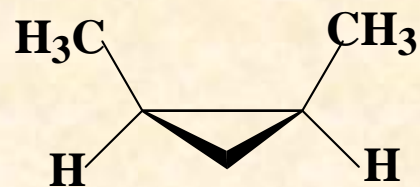
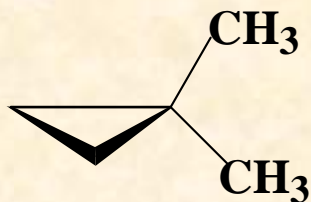
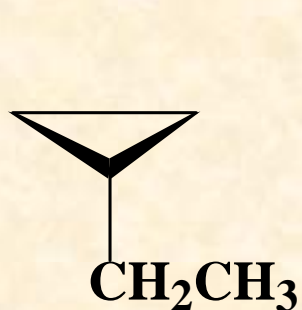
6.



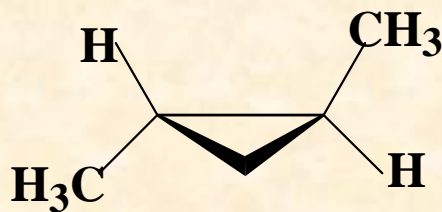
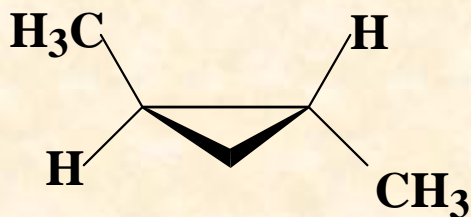
同一化合物

七、推结构:

1. 分子式 C_5H_{10} , 而且具有三元环的所有异构体(包括顺, 反, 对映异构体)共有多少个? 画出它们的结构式(表示出立体结构)。



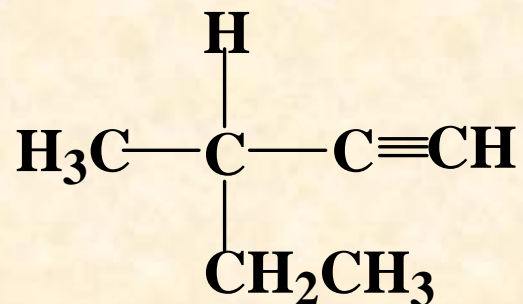
顺-1,2-二甲基环丙烷



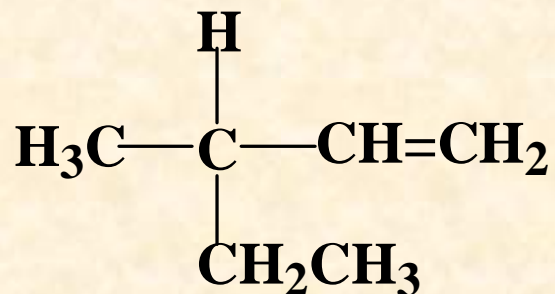
(1S, 2S)-1, 2-二甲基环丙烷 (1R, 2R)-1, 2-二甲基环丙烷

2. 各写出能满足下列条件的一个化合物的结构式:

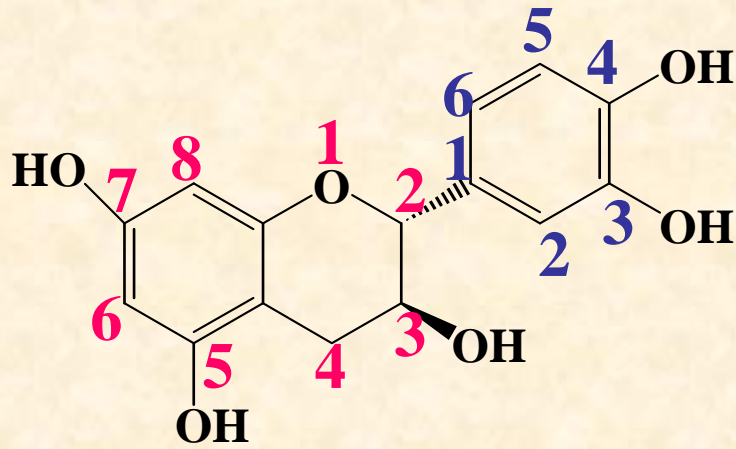
具有手性碳原子的炔烃, C_6H_{10}



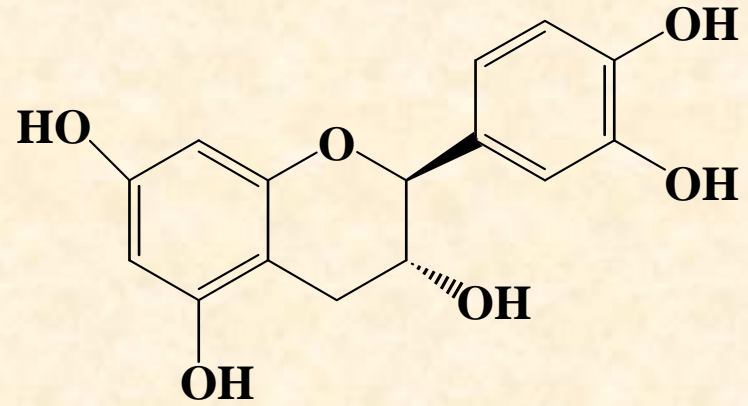
具有手性碳原子的烯烃, C_6H_{12}



3、儿茶素[2-(3,4-二羟基)-3,5,7-三羟基氢化苯并吡喃]含有两个手性碳原子,它该有两对互为对映体的构型异构体,分别称它们为±儿茶素(2S, 3R)和(2R, 3S)与±表儿茶素(2S, 3S)和(2R, 3R)。试写出它们的结构式。

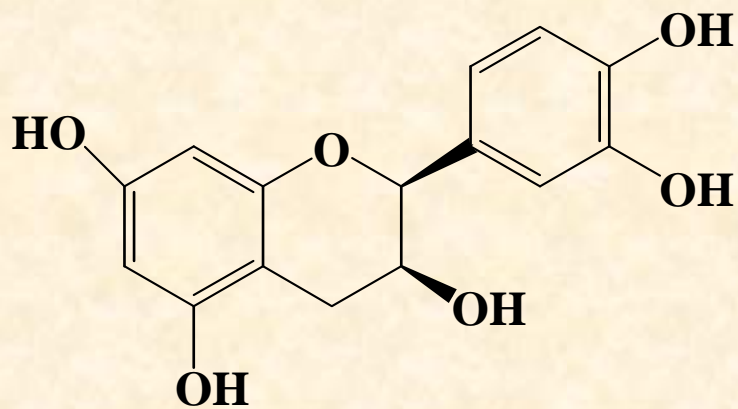


(2R, 3S)

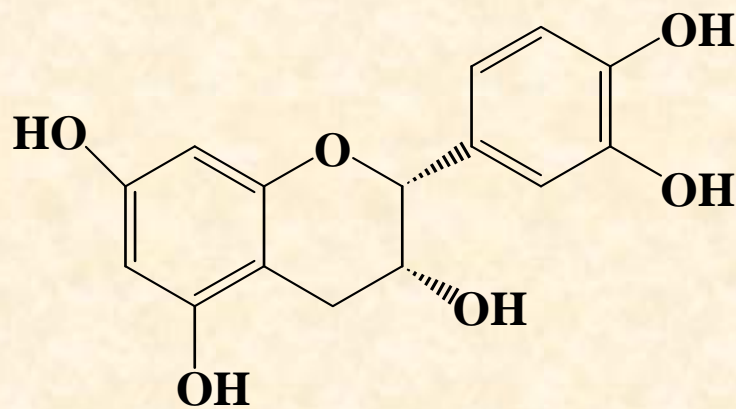


(2S, 3R)

儿茶素



(2S, 3S)



(2R, 3R)

表儿茶素