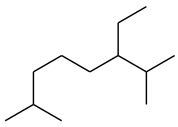
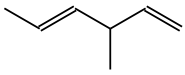
# 2026 年少年班物质结构与性质（有机篇）期末考试（回忆版）

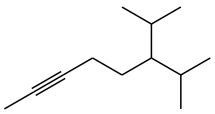
被有机化学肘飞的草酸二酯（双草酸酯），凪の未来から (gonh)

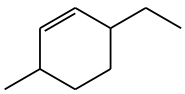
2026 年 6 月 7 日

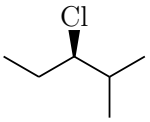
## 一、请给出下列化合物 IUPAC 的英文名称或写出相应化学结构（每小题 1 分，共 12 分）

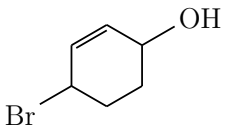
**1.** 

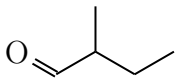
**2.** 

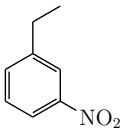
**3.** 

**4.** 

**5.** 


**6.** 


**7.** 


**8.** 


**9.** 3-methoxyphenol

**10.** ditert-butyl ether

**11.** N, N-dimethylaniline

**12.** cis-1,3-dimethylcyclohexane

## 二、选择题（每小题 2 分，共 30 分）

**1.** 下列分子在水中溶解度最大的是（　）

A. 正丁醇　　B. 苯酚　　C. 乙醇　　D. 正丁醛

**2.** 下列选项中有极性共价键，但不是极性分子的有（　）

A. 正丁烷　　B. 正丁醇　　C. 氯仿　　D. 四氯化碳

**3.** 以下说法中正确的是（　）

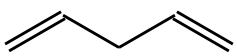
A. 在亲电加成中烯烃的反应活性高于炔烃

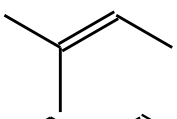
B. 所有双键中的碳原子都是 $sp^2$ 杂化的

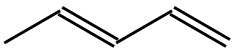
C. 乙醚挥发性大但是不易燃

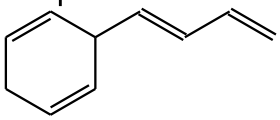
D. 所有的烯醇都不能稳定存在

**4.** 下列四个选项中，最稳定的是（ ）

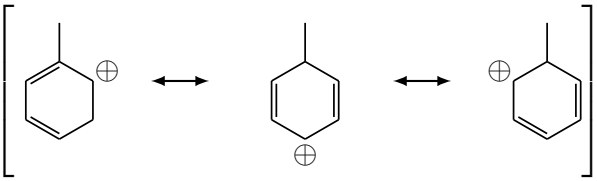
A. 

B. 

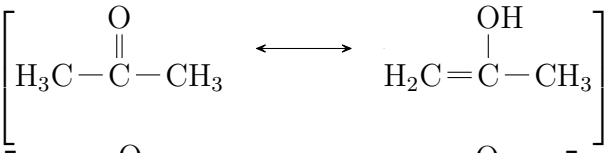
C. 

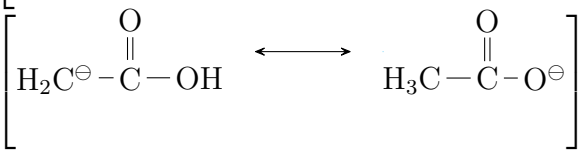
D. 

**5.** 下列共振式中正确的是（ ）

A. 

B. $\left[CH_2=CH-CH_2\cdot \longleftrightarrow \dot{C}H_2-\dot{C}H_2-CH_3\right]$

C. 

D. 

**6.** 判断下列两个化合物之间的关系是（ ）

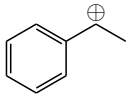
A. 同一种分子

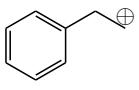
B. 对映异构体

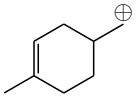
C. 顺反异构体

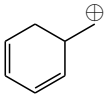
D. 构象异构体

**7.** 下列碳正离子中稳定性最好的是（ ）

A. 

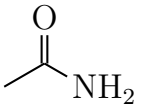
B. 

C. 

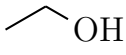
D. 

**8.** 下列分子中碱性最强的是（ ）

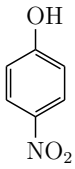
A.


B. 

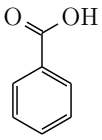

C.

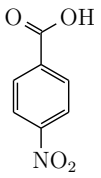

D. 


**9.** 以下分子中酸性最强的是（ ）

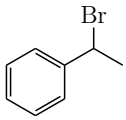
A. 

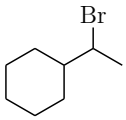

B.

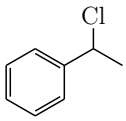

C. 

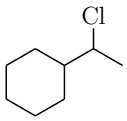

D. 


**10.** 选项中按照以下分子发生 $S_{N1}$ 反应的难易程度排序中正确的是（ ）

A. 


B. 


C. 


D. 


**11.** （多选）选项中是 sp 杂化的分子有（ ）

A. $AlCl_3$ B. $BeCl_2$ C. $BF_3$ D. $CO_2$

**12.** （多选）下列说法中正确的有（ ）

A. 分子结构中具有手性碳原子一定是手性分子

B. 分子结构中含有对称面一定是手性分子

C. 一对对映异构体总是呈现实物与镜像的关系

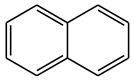
D. 外消旋体是混合物，不具有旋光性

**13.** （多选）下列选项中不具有芳香性的有（ ）

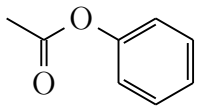
A.

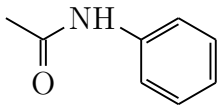

B.

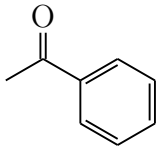
C.

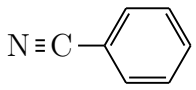
D. 

**14.** （多选）以下分子在发生磺酸基亲电取代时，会取代在间位上的有（ ）

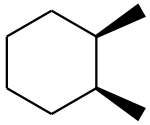
A. 

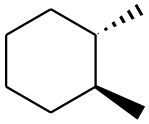

B. 

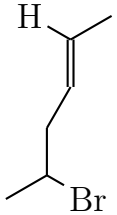

C. 

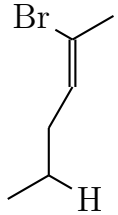

D. 


**15.** （多选）下列分子中，即具有顺反异构体又具有旋光异构体的选项有（ ）

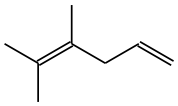
A. 

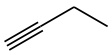
B. 

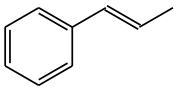
C. 

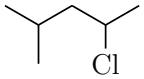

D. 

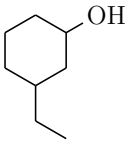
## 三、完成下列反应式（每小题 2 分，共 20 分）

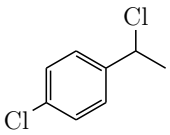
**1.**  $\xrightarrow{Br_2\ (1\ mol)}$

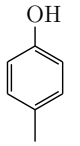
**2.**  $\xrightarrow{2HBr}$

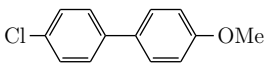
**3.**  $\xrightarrow{HBr}$

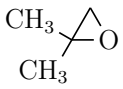
**4.**  $\xrightarrow{NaCN}$ $\xrightarrow{H_3O^+}$

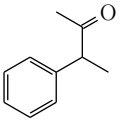
**5.**  $\xrightarrow{KMnO_4}$

**6.**  $\xrightarrow{NH}$

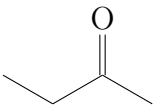
**7.**  $\xrightarrow{O\quad O\quad O}$

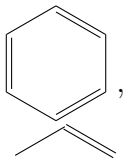
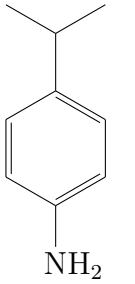
**8.**  $\xrightarrow[\Delta]{FeCl_3/Cl2}$

**9.**  $\xrightarrow{CH_3NH_2}$

**10.**  $\xrightarrow{NH}$

## 四、用指定化合物及简单必要试剂合成下列化合物[1]（每小题 6 分，共 12 分）

**1.** $HC{\equiv}CH \Longrightarrow$ 

**2.**  , $\Longrightarrow$ 

## 五、回答问题（每小题 5 分，共 20 分）

**1.** 在表面活性剂合成实验中抽滤时有哪些注意事项

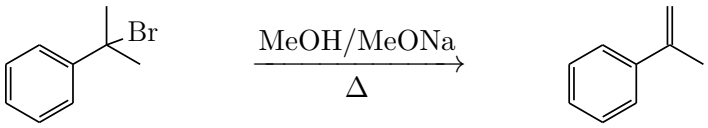
**2.** 请设计化学方法鉴别环丙烷，正丙醇，对甲基苯酚这三种物质

**3.** A($C_6H_{10}$) 是一种有机物，他和碱性高锰酸钾的稀冷溶液反应可以生成 B($C_6H_{12}O_2$)。B 在热的浓硫酸中脱水可以得到 C($C_6H_8$)。A 的臭氧化水解产物为$CH_3COCH_2CH_2CH_2CHO$。请推断 A,B,C 的结构。

**4.** 如下的反应是使用 2-溴-2-甲基丁烷 (2-bromo-2-methylbutane) 与乙醇钠 (sodium ethanolate) 反应制备 2-乙氧基-2-甲基丁烷 (2-ethoxy-2-methylbutane) 的过程。请分析该反应是否可行，给出答案并说明理由：

## 六、给出该反应的合理反应机理（每小题 6 分，共 6 分）

**1.**




[1]答题卡上写的是：用指定有机物及必要无机物合成下列化合物