

國立高雄應用科技大學
101 學年度碩士班招生考試
化學工程與材料工程系

准考證號碼 (考生必須填寫)

有機化學

試題 共 4 頁，第 1 頁

- 注意：a. 本試題共 題，每題 分，共 100 分。
b. 作答時不必抄題。
c. 考生作答前請詳閱答案卷之考生注意事項。

a. 本試題共 10 題，每題 5 分，共 50 分。

共 4 頁，第 2 頁

1. Which molecule has a zero dipole moment?

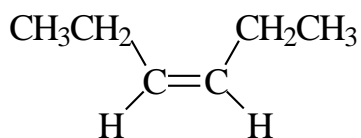
A) CO_2 , B) SO_2 , C) CO , D) H_2O , E) CH_2Cl_2

2. Which has the highest basicity?

A) F^- , B) OCH_3^- , C) NH_2^- , D) CH_3CH_2^- , E) Br^-

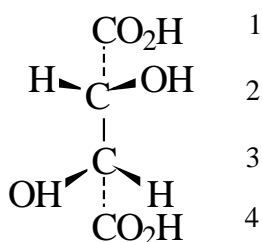
3. What is the right name of this compound? ()-3-hexene

A) *E*-, B) *Z*-, C) *cis*-, D) *trans*-, E) none



4. Determine the *R* or *S* for the following compound;

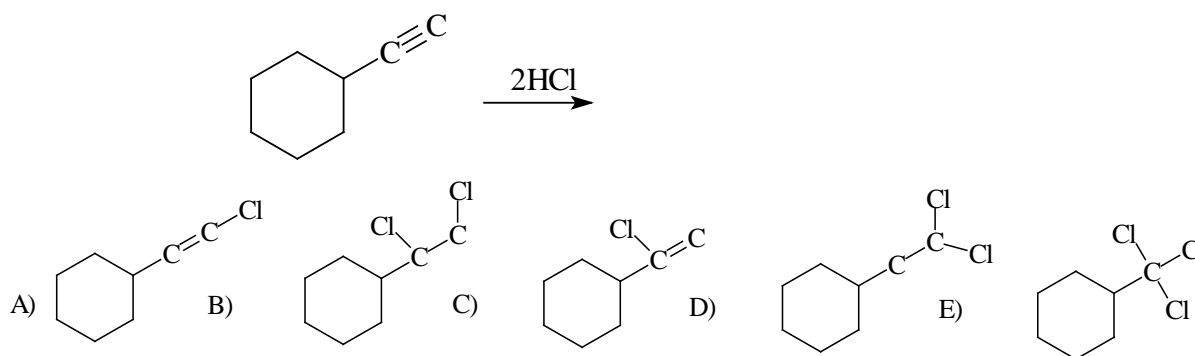
A) 2*S*,3*S* B) 2*S*,3*R* C) 2*R*,3*S* D) 2*R*,3*R* E) none



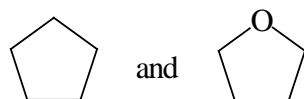
5. Which has the obvious broad peak in the UV-Vis spectrum?

A) Benzene, B) CH_3OH , C) CH_4 , D) HBr , E) CO_2

6. What is the product of this reaction?

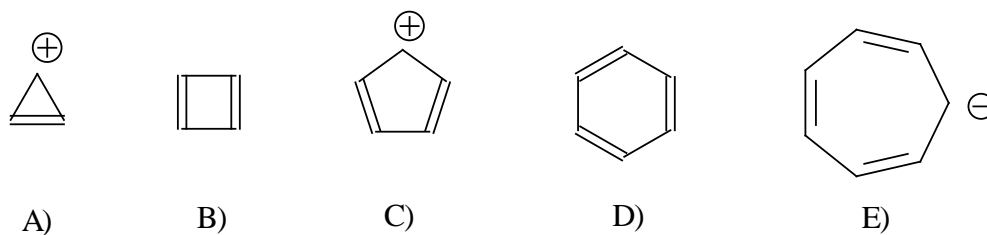


7. What reagent(s) can be used to distinguish the following compounds?



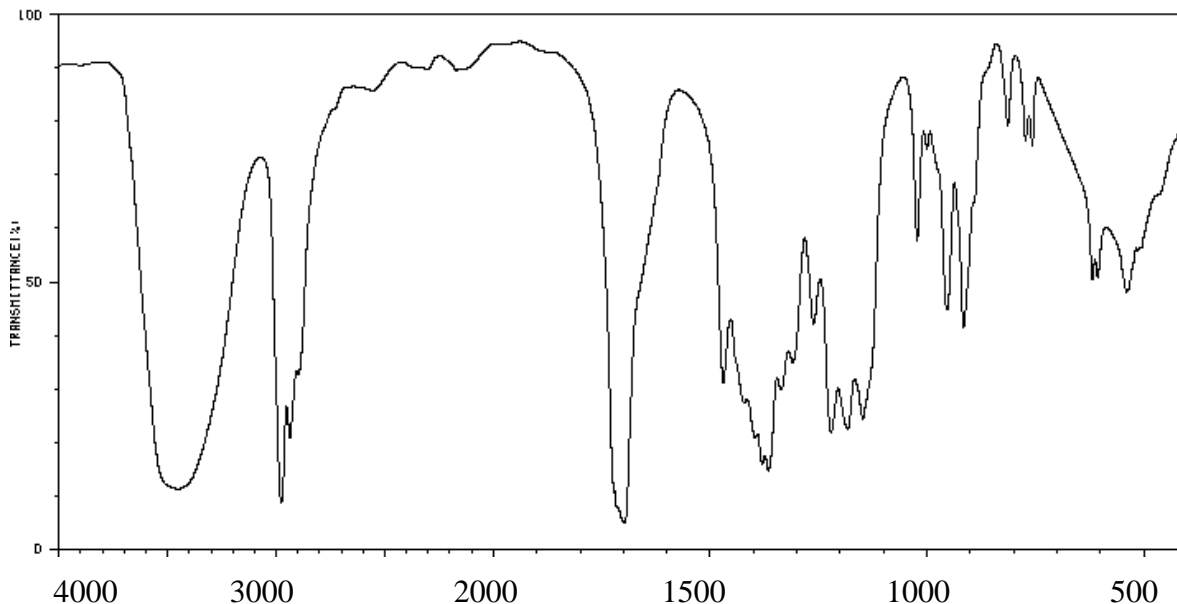
A) $\text{AgNO}_3/\text{CH}_3\text{CH}_2\text{OH}$, B) *concd.* H_2SO_4 , C) $\text{NaCl}/\text{H}_2\text{O}$, D) O_3/N_2 , E) OsO_4

8. Which is antiaromatic?



9. Predict the material from the following FT-IR spectrum;

A) $\text{CH}_3\text{COCH}_2\text{OH}$, B) CH_3COH , C) $\text{CH}_3\text{CH}_2\text{Br}$, D) CH_3OCH_3 ,
 E) CH_3COCH_3



(Spectrum obtained from: SDBSWeb: <http://www.aist.go.jp/RIODB/SDBS/>)

10. The *best* nucleophile in a substitution reaction at a primary carbon.

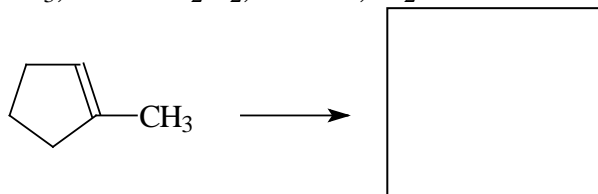
A) CH_3CO_2^- , B) OH^- , C) H_2O , D) $(\text{CH}_3)_3\text{CO}^-$, E) Br^- .

b. 本試題共5 題，每題 10 分，共50分。

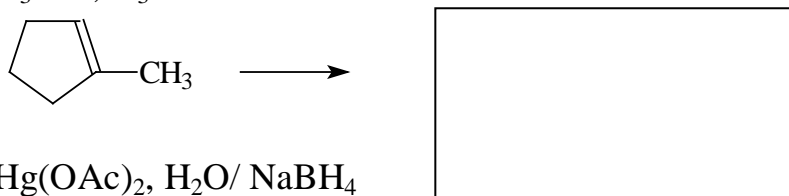
共 4 頁，第 4 頁

Finish the following reactions:

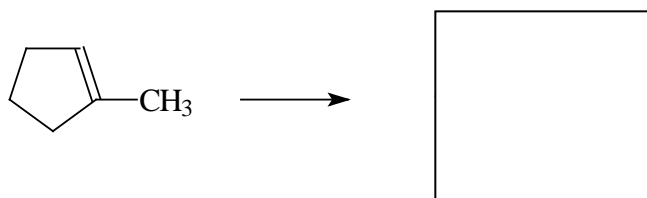
1. BH_3 , THF/ H_2O_2 , NaOH, H_2O



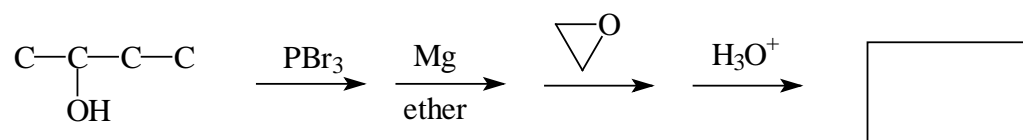
2. O_3 / Zn, H_3O^+



3. $\text{Hg}(\text{OAc})_2$, H_2O / NaBH_4



4. What is the product after these reactions?



5. Poly(3-hexylthiophene) (P3HT) is one of the most used materials in the organic solar cell, please finish the synthesis processes of this compound.

