

國立勤益科技大學九十七學年度研究所碩士班招生筆試試題卷

所別： 化工與材料工程系碩士班

組別：

科目： 有機化學

准考證號碼： (考生自填)

考生注意事項：

一、考試時間 100 分鐘。

二、

三、

一：〈 10 分〉

假設你有任何所需無機試劑及乙醇，請寫出你將如何由乙醇開始製備乙醚之反應方程式。

二：〈 10 分〉

用苯開始，提出間-氯苯甲酸的合成計畫？

三：〈 10 分〉

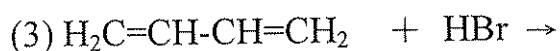
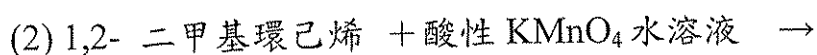
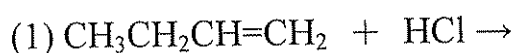
畫出化學式 C_4H_8 可能的異構物 (忽略立體異構物)。

四：〈 10 分〉

以 Benzoyl peroxide 為起始劑，寫出乙烯的自由基聚合作用成聚乙烯的反應步驟。

五：〈 10 分〉

Give products for each of the following reactions.



六：〈 5 分〉

Rearrangements are likely to occur in which of the following reaction types?

- A) $\text{S}_{\text{N}}1$ reactions
- B) $\text{S}_{\text{N}}2$ reactions
- C) E1 reactions
- D) E2 reactions
- E) Both $\text{S}_{\text{N}}1$ and E1 reactions

七：〈 5 分〉

Which of the following reagents might serve as the basis for a simple chemical test that would distinguish between pure 1-hexene and pure hexane?

- A) Bromine in carbon tetrachloride

- B) Dilute aqueous potassium permanganate
- C) Concentrated sulfuric acid
- D) All of the above
- E) Answers A) and B) only

八：〈 5 分 〉

Consider the addition of HCl to 3-methyl-1-butene. The major product of the reaction would be:

- A) 1-Chloro-2-methylbutane
- B) 1-Chloro-3-methylbutane
- C) 2-Chloro-2-methylbutane
- D) 2-Chloro-3-methylbutane
- E) 1-Chloropentane

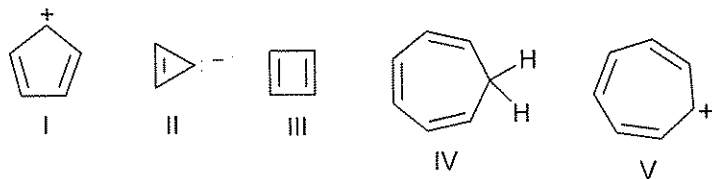
九：〈 5 分 〉

trans-3-methylcyclopentanol is treated with $\text{CH}_3\text{SO}_2\text{Cl}$ in the presence of base. The product of this reaction is then heated with KI in methanol. What is the final product?

- A) trans-1-Iodo-3-methylcyclopentane
- B) cis-1-Iodo-3-methylcyclopentane
- C) 1-methylcyclopentene
- D) 2-methylcyclopentene
- E) 3-methylcyclopentene

十：〈 5 分 〉

Which of the following would you expect to be aromatic?



- A) I B) II C) III D) IV E) V

十一：〈 5 分 〉

Which is the most stable conformation of cyclohexane?

- A) Chair
- B) Twist
- C) Boat

- D) Half chair
- E) Staggered

十二：〈 5 分〉

Hexane and 3-methylpentane are examples of:

- A) enantiomers.
- B) stereoisomers.
- C) diastereomers.
- D) constitutional isomers
- E) None of these

十三：〈 5 分〉

Which one of the following can exist in optically active forms?

- A) cis-1, 3-Dichlorocyclohexane
- B) trans-1, 3- Dichlorocyclohexane
- C) cis-1, 4-Dichlorocyclohexane
- D) trans-1, 4- Dichlorocyclohexane
- E) cis-1, 2-Dichlorocyclohexane

十四：〈 5 分〉

Enantiomers are:

- A) molecules that have a mirror image.
- B) molecules that have at least one stereogenic center.
- C) non-superposable molecules.
- D) non-superposable constitutional isomers.
- E) non-superposable molecules that are mirror images of each other.

十五：〈 5 分〉

S_N2 reactions of the type, $Nu^- + R-L \rightarrow Nu-R + L^-$ are favored:

- A) When tertiary substrates are used.
- B) When primary substrates are used.
- C) When the leaving group, L^- , is a strong base.
- D) by more than one of the above.
- E) by none of the above.