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國立臺北科技大學

九十四學年度有機高分子研究所碩士在職專班入學考試

甲組：有機化學（含光譜分析） 試題

填准考證號碼　　第一頁　共一頁

注意事項：

1. 本試題共 20 題，每題 5 分，配分共 100 分。
2. 請按順序標明題號作答，不必抄題。
3. 全部答案均須答在試卷答案欄內，否則不予計分。

1. Draw the enol tautomer of cyclohexanone.
2. What product would be obtained from the hydroboration-oxidation of 2-methyl-2-butene?
3. Give the systematic name for $CH_3CH_2CH_2CH_2CH_2CH(CH_3)CH_2CH_3$.
4. How could you distinguish the following compounds using ^1H NMR spectroscopy?
   $CH_3C(O)OCH_2CH_3$,　$CH_3CH_2C(O)OCH_3$,　$HC(O)OCH_2CH_2CH_3$
5. How could you distinguish between the IR spectra of the following compounds?
   $C_6H_5C(O)CH_3$ and $C_6H_5CH_2OCH_3$
6. Give the major product of E2 reaction of $C_6H_5CH_2CH(Cl)CH(CH_3)_2$ with hydroxide ion.
7. Give the first step of propagation step in the monochlorination of methane.
8. Give the major product for the reaction of $C_6H_5NO_2$ with H_2SO_4.
9. What alcohol would be formed from the reaction of ethylene oxide with CH_3CH_2MgBr?
10. Give the major product for the reaction of iodobenzene with $(CH_3CH_2)_2CuLi$?
11. What approximate intensities would you expect for the $M^{\cdot+}$ and $M^{\cdot+}+2$ peaks of CH_3Cl?
12. Assuming you have bromobenzene, magnesium, dry ether, and deuterium oxide available, show how you might synthesize C_6H_5D.
13. Write the structure of furan.
14. What would you expect to be the major product when 1-phenylpropene reacts with HCl?
15. Which of the following halides would you expect to be most reactive in an S_N2 reaction?
    $CH_3CH_2CH{=}CHCH_2Br$,　$CH_3CH{=}CHCHBrCH_3$,　$CH_2{=}CHCBr(CH_3)_2$
16. What product would form when 4-methylbenzaldehyde reacts with hot $KMnO_4$, OH^-, then

H_3O^+?

17. Arrange the following compounds in order of decreasing acidity:
    $CH_3CH_2NH_2$, CH_3CH_2OH, $CH_3CH_2C{\equiv}CH$
18. For each of the following compounds indicate the hybridization of the carbon atoms:
    CO_2, HCOOH, HCN, CH_3OH, $CH_2{=}CH_2$
19. Draw the more stable chair conformer for *trans*-1,2-dimethylcyclohexane.
20. Give the structure of *sec*-butyl isobutyl acetylene.