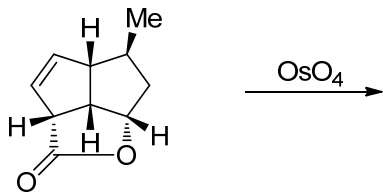
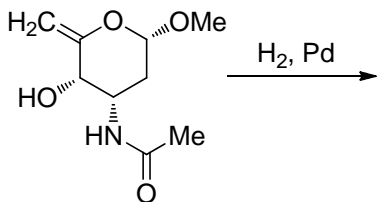
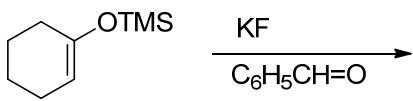
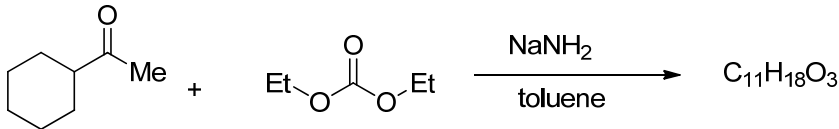
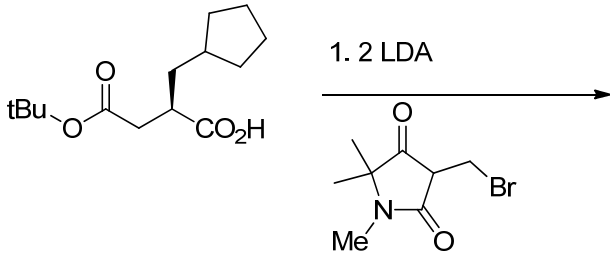
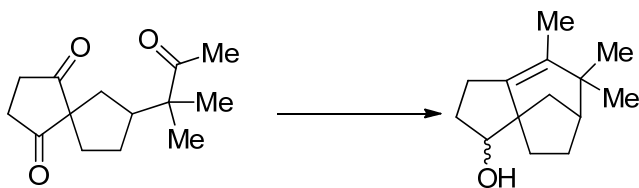


高雄醫學大學 100 學年度研究所招生考試試卷 系所：醫化所 科目：綜合化學-有機

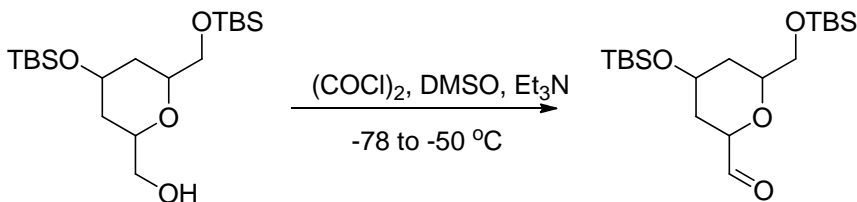
1. Please indicate the major product of the following reactions (3pt for each)



2. Please indicate suitable reagent(s) to complete the following reactions. (5pt)



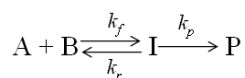
3. Please propose a suitable mechanism of the following reaction. (5pt)



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PS. 可用計算機作答

高雄醫學大學 100 學年度研究所招生考試試卷
系所: 醫藥暨應用化學博士班系
科目: 綜合化學-物化

1. Please state the three laws of thermodynamic in your words. (6%)
2. Please describe how to determine the activation energy of a chemical reaction in experiment. (4%)
3. Consider the π -network in octatetraene, C_8H_{10} , using the particle in the box model. To calculate the box length, assume that the molecular is linear and use the values 135 and 154 pm for C=C and C-C bonds. What is the wavelength of light required to induce a transition from the ground state to the first excited state? (5%)
4. Write the Slater determinant for the ground-state configuration of Be, and explain why wave functions should be expressed in this form? (4%)
5. Derive the rate law for the following reaction at the condition (i) $k_f, k_r \gg k_p$ (ii) $k_f \ll k_p$. (6%)



可使用不具翻譯功能之工程型或一般型電子計算機

1. Please state the difference between (a.) Precision and Accuracy. (2%)
2. Estimate the absolute standard deviation and the coefficient of variation for the results of the following calculations: $y=5.75(\pm 0.03)+0.833(\pm 0.001)-8.021(\pm 0.001) = -1.438$
Round each result so that it contains only significant digits. (2%)
3. Please define “Buffer solution” and explain how a buffer solution can resist pH elevation briefly. (3%)
4. 50.0 mL of 0.10 M acetic acid ($K_a=1.8\times 10^{-5}$) was titrated with 0.10 M NaOH. Please calculate the pH when (a.) 0 mL (b.) 10.0 mL (c.) 25.0 mL (d.) 50.0 mL and (e.) 60.0 mL of NaOH was added. (7%)
5. Why are photoluminescence spectroscopic methods always sensitive than absorption spectroscopic methods? (2%)
6. Why atomic spectra usually are observed in line spectra but molecular spectra are observed in band spectra? (3%)
7. Please explain the procedures of (a.) the standard addition (spiking) method and (b.) external-standard calibration used in chemical (quantitative) analysis, respectively. (4%)
8. Please convert the following units: (2%)
 - (a.) 0.350 of absorbance = _____ % of transmittance.
 - (b.) 10.94 % of transmittance = _____ of absorbance
 - (c.) $\lambda = 785.0 \text{ nm} = \text{_____ cm}^{-1} = \text{_____ Hz}$
 - (d.) $\bar{\nu} = 15000 \text{ cm}^{-1} = \text{_____ nm}$

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高雄醫學大學 100 學年度 系所：醫藥暨應用化學系博士班
研究所招生考試試卷 科目：綜合化學 - 無機

1. Explain why most inorganic complexes follow the 18-electron rule. (5)
2. List what kind of instruments could be used to analyze the inorganic complexes and describe their purpose and function. (10)
3. Explain the differences between the molecular orbital theory, crystal field theory, and ligand field theory. (10)