

國立臺北教育大學 103 學年度碩士班招生入學考試
自然科學教育學系碩士班 化學 科試題

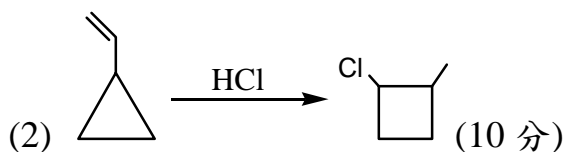
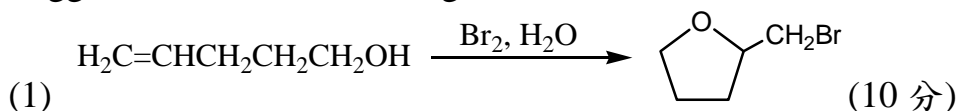
1. List the major components of a monochromator. (10 分)

2. Explain each of the following:

(1) 酸度: Cyclopentadiene > Cyclopropene (5 分)

(2) 鹼度: $\text{Me}_3\text{N} > \text{Me}_3\text{P}$ (5 分)

3. Suggest the mechanism, using curved arrows to show electron movement.



4. Explain the following terms:

(1) Heisenberg's Uncertainty Principle (5 分)

(2) van der Waals Equation (5 分)

5. Sketch the most likely structure of PCl_3Br_2 and explain your reasoning. (10 分)

6. Draw and determine the point groups for staggered conformation ethane and eclipsed conformation ethane. (10 分)

7. Show that spheres occupy 74.0% of the total volume in a face-centered cubic structure in which all atoms are identical. (10 分)

8. Calculate the percent dissociation for a 0.22M solution of chlorous acid ($\text{HClO}_2, K_a = 1.2 \times 10^{-2}$). (10 分)

9. If the half-life for a reaction is 20 seconds, what would be the second half-life, assuming the reaction is either zero, first, or second order? (10 分)