

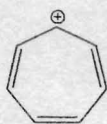


1. 請排列下列元素之電負度大小順序。(5%)

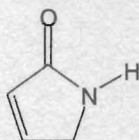
Br, N, O, H, C, F

2. 請分別指出下列的分子結構是屬於aromatic、antiaromatic或nonaromatic。(18%)

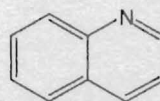
(a)



(b)



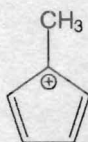
(c)



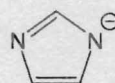
(d)



(e)



(f)



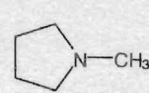
3. 下列哪一個化合物是屬於三級胺?(3%)

(a)



;

(b)



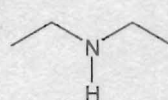
;

(c)



;

(d)



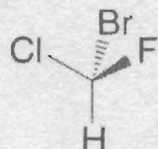
4. 當添加溴於 cis-2-butene 時，請依據 cyclic bromonium ion 畫出其反應機制並畫出其主要產物。(10%)

5. 請畫出 4-fluoromethyl-2-nitroanisole 的化學結構。(5%)

6. 有一化合物( $C_8H_{10}$ )的氫譜中有三個主要吸收峰，面積比是5:2:3，化學位移 $\delta$ 值分別是：(1) 7.2 ppm (單峰)、(2) 2.6 ppm (四重峰)、(3) 1.2 ppm (三重峰)，請問三個吸收峰所對應的基團各是什麼(6%)? 請畫出此化合物的結構。(3%)

7. 請說出下列每小題中之兩結構是 enantiomers，還是相同化合物?

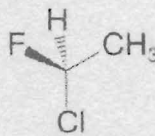
(a) 5%



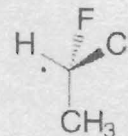
and



(b) 5%



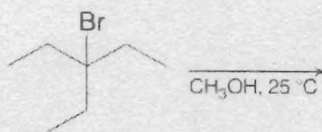
and



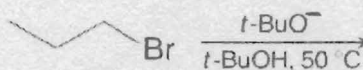


8. 下列反應中，其產物為何？如果有超過一種產物，請標示其主產物(major product)與副產物(minor product)。並請標示各產物是經由何種反應機構(S<sub>N</sub>1, S<sub>N</sub>2, E1 還是 E2)形成。

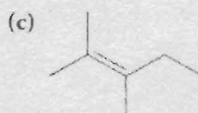
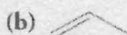
(a) 5%



(b) 5%

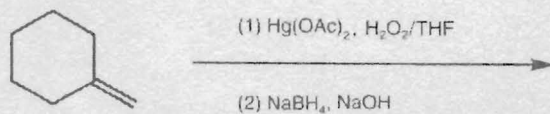


9. 下列三種 alkenes 與 HBr 反應，請依序排列反應速率最快是哪一個？最慢是哪一個？(5%)

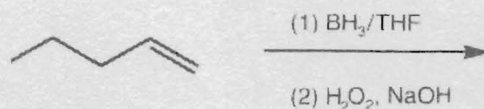


10. 預測下列反應的產物。

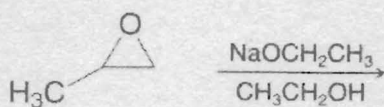
(a) 5%



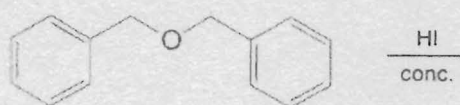
(b) 5%



(c) 5%



(d) 5%



(e) 5%

