

科目：有機化學(1002)

校系所組：中央大學化學學系

交通大學應用化學系 (甲組)

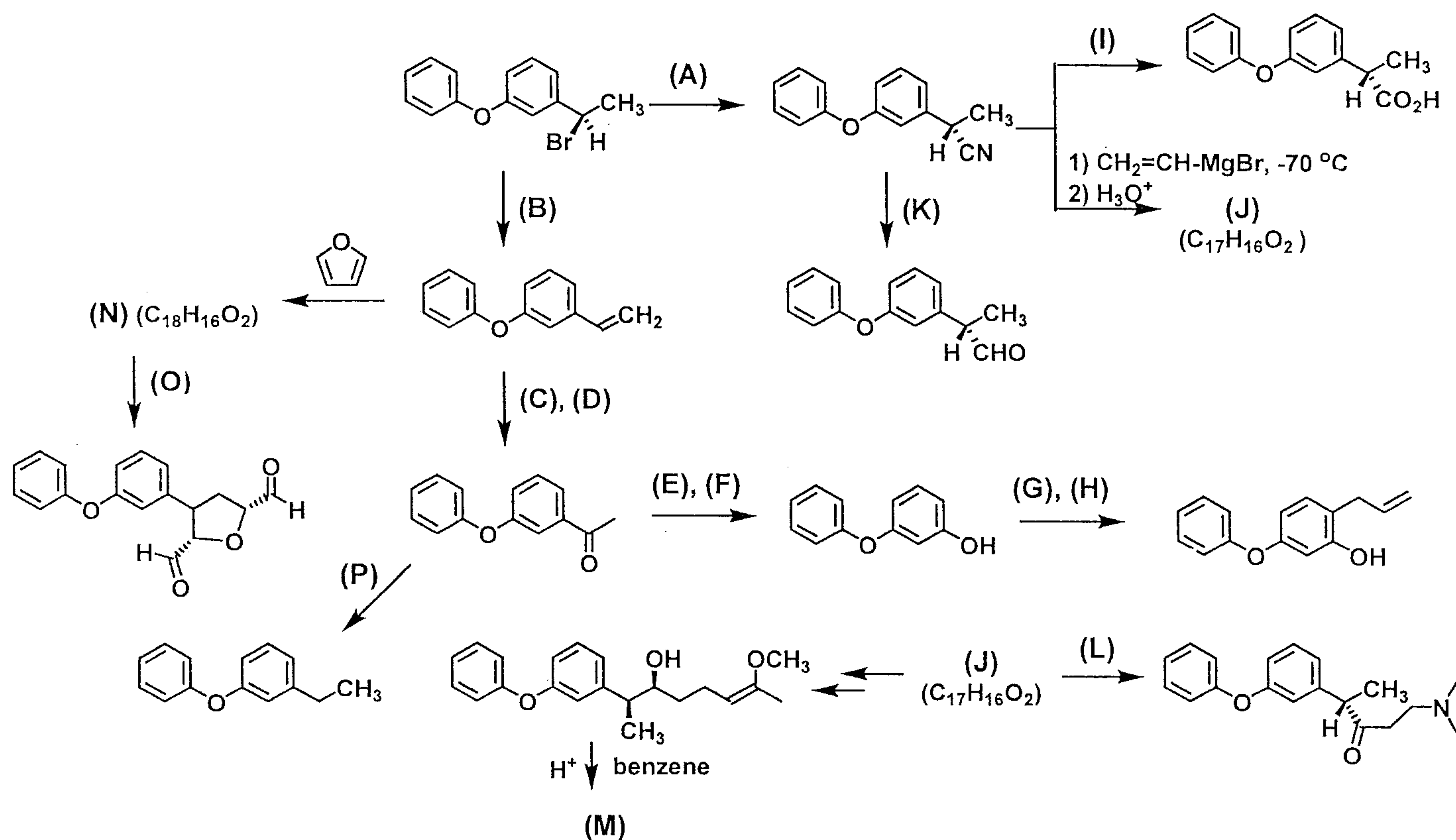
清華大學化學系

清華大學材料科學工程學系 (丙組)

參考圖

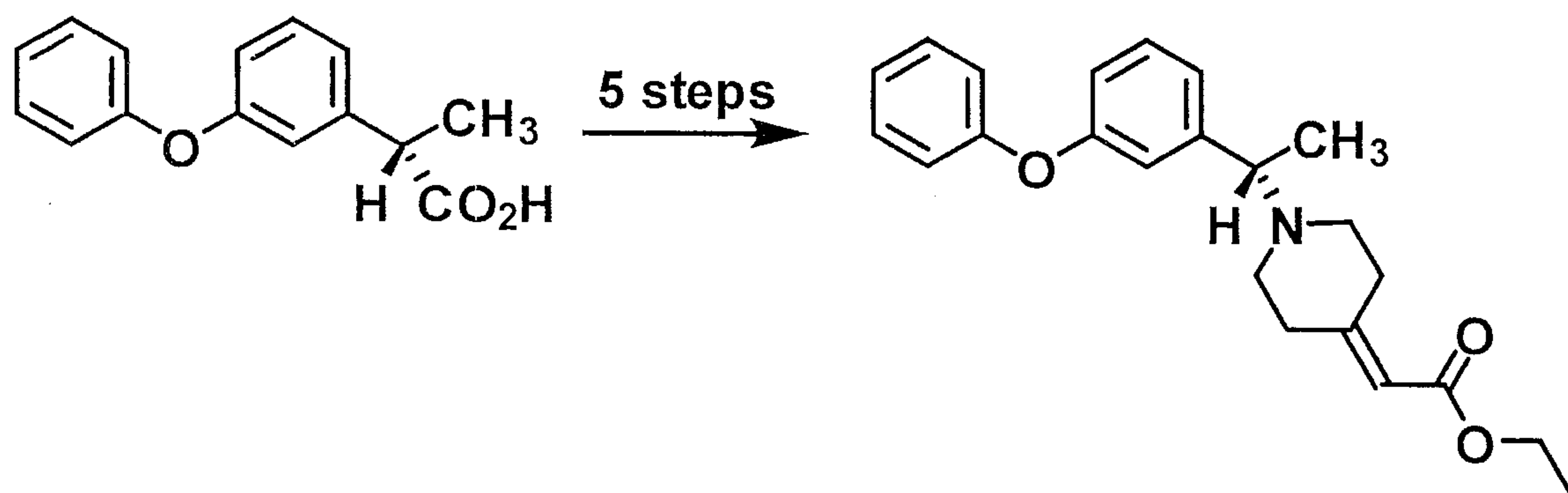
一、Provide suitable reagents or products (A)-(P) to complete the following sequences of reactions
(16 problems, 2%/each)

(32%)



二、Multiple step synthesis:

(10%)



注意：背面有試題

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三、Multiple choice (4 problems, 2%/each, total 8%)

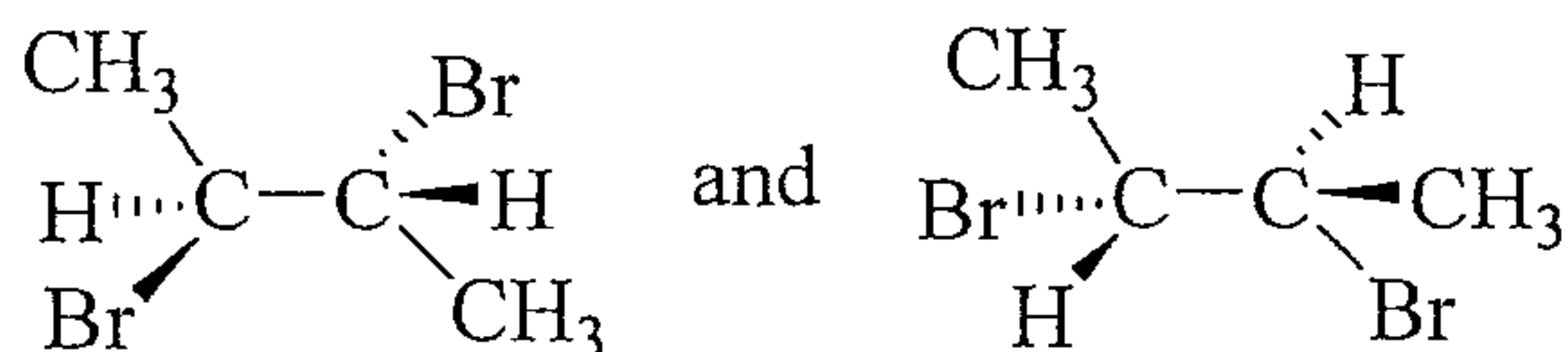
(一) Rank the following compounds in order of increasing acidity (2%)

a : $\text{HCCl}_2\text{CO}_2\text{H}$; b : $\text{CH}_3\text{CO}_2\text{H}$; c : $\text{CF}_3\text{CO}_2\text{H}$; d : $\text{ClCH}_2\text{CH}_2\text{CO}_2\text{H}$

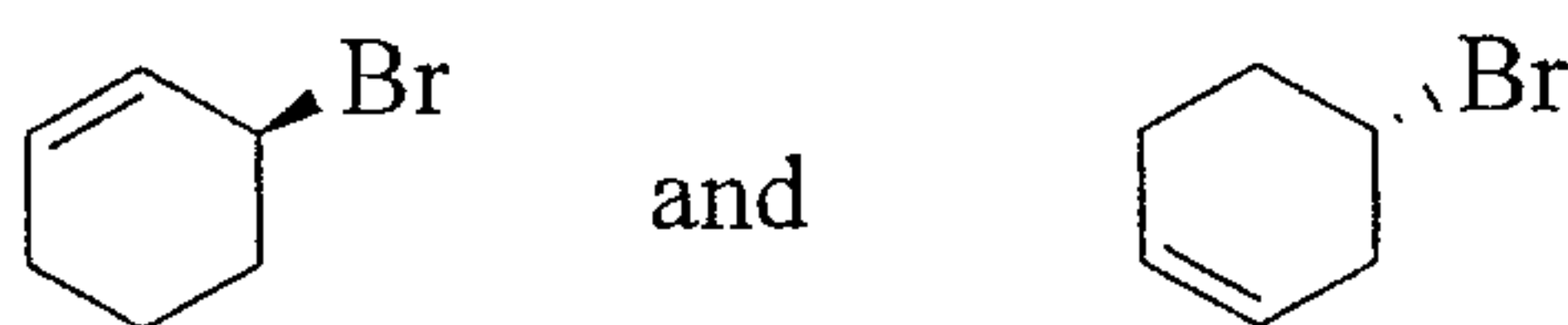
- (1) $d < b < c < a$ (2) $b < d < a < c$ (3) $b < a < d < c$
 (4) $b < d < c < a$ (5) $d < b < a < c$

(二) For each pair, give the correct relationship between the two compounds. (enantiomer, diastereomers, constitutional isomers or same compounds) (2%)

a :

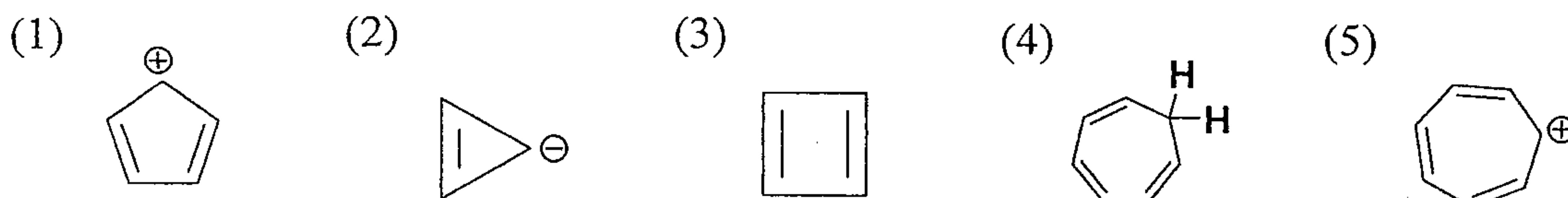


b :



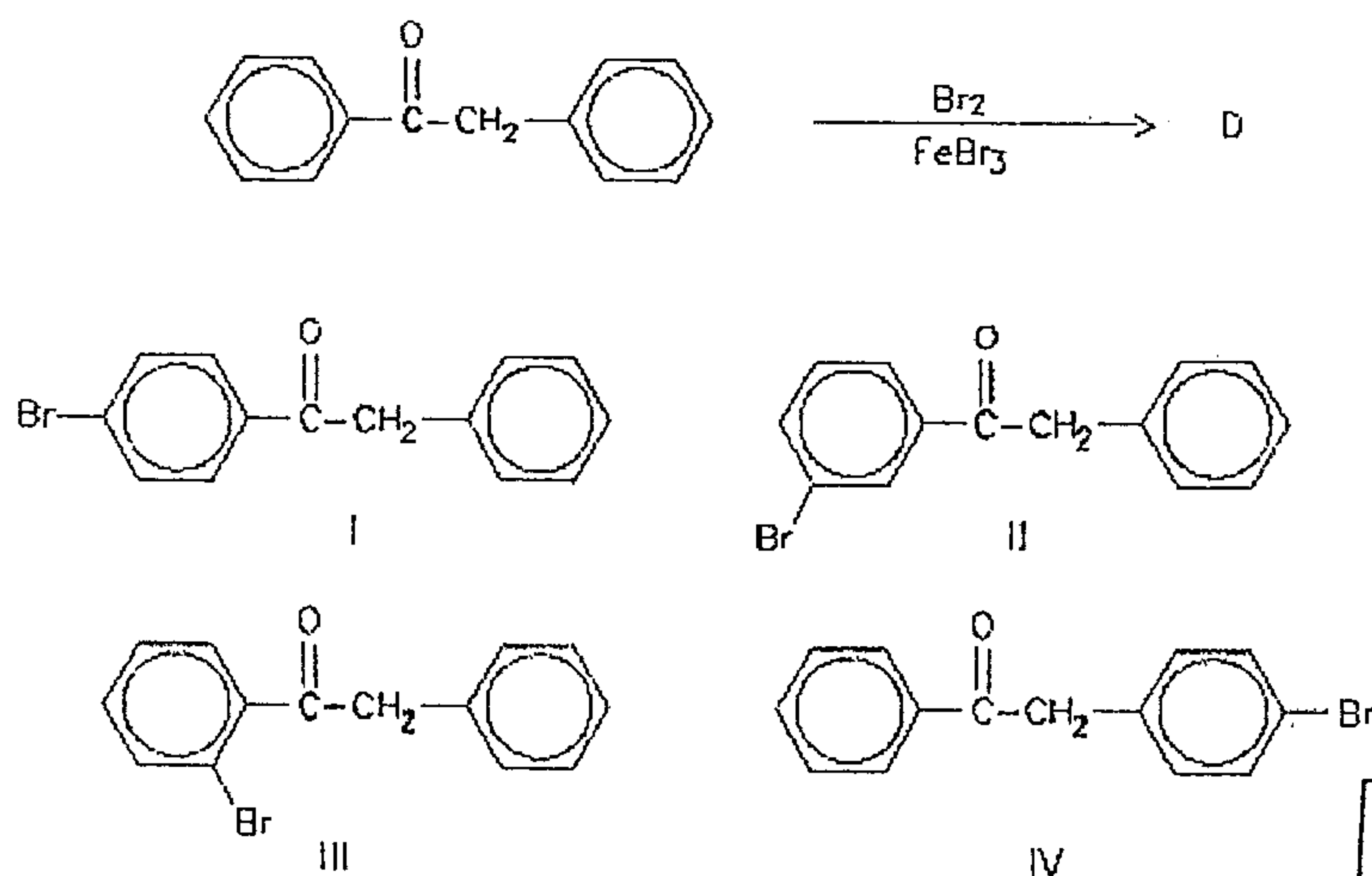
- (1) a : diastereomers b : constitutional isomers. (2) a : enantiomers b : identical.
 (3) a : diastereomers b : enantiomers. (4) a : enantiomers b : constitutional isomers.
 (5) a : identical b : constitutional isomers.

(三) Which of the following would you expect to be aromatic? (2%)



(四) The major product(s), D, of the following reaction, would be: (2%)

- (1) I (2) II (3) III (4) IV (5) Equal amounts of I and II



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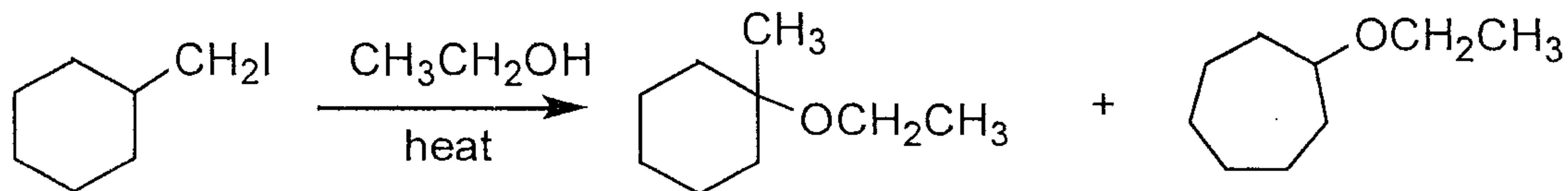
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參考用

四、Propose a reaction mechanism for the following reaction.

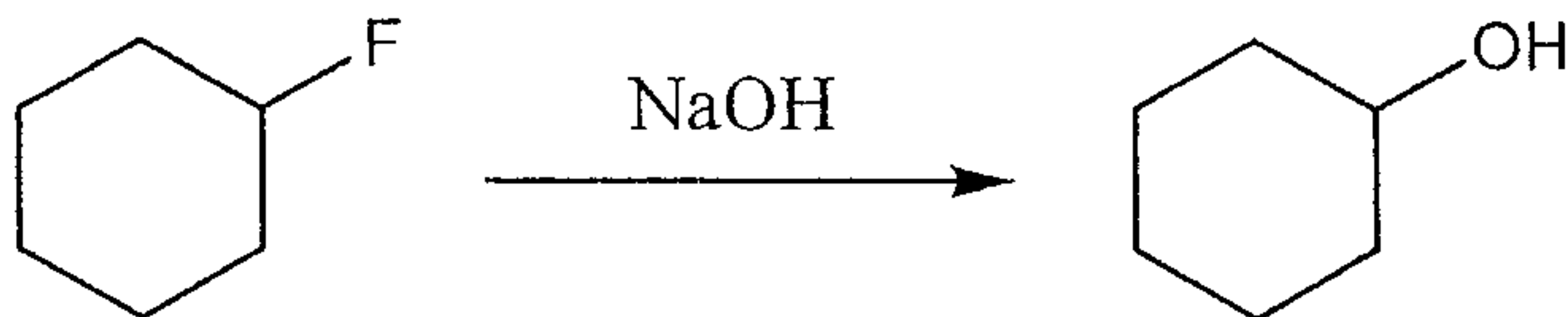
(10%)



五、The reactions shown below are unlikely to occur as written.

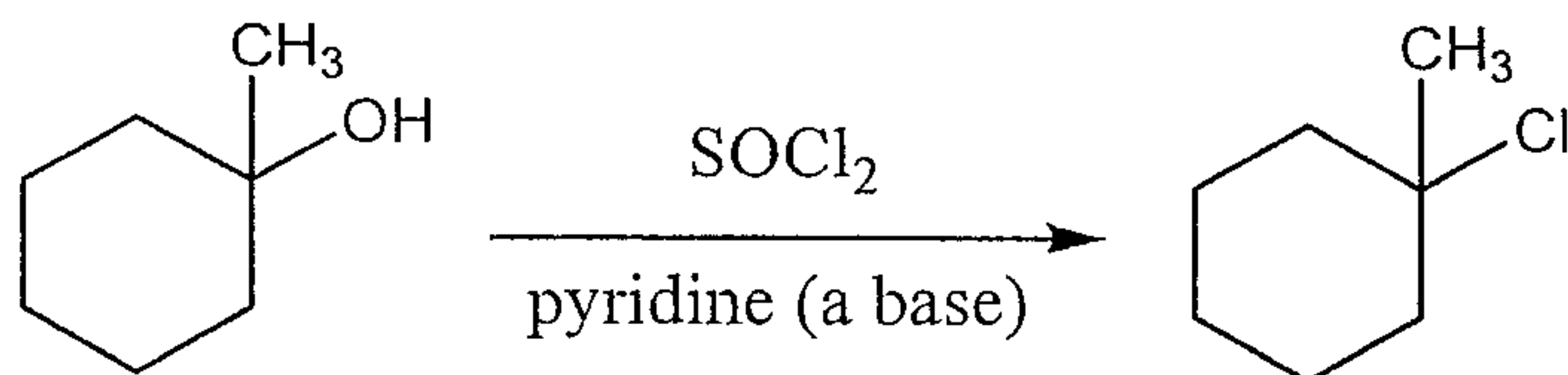
(一) What is wrong with this reaction? What would be the most likely product for this reaction?

(10%)



(二) What is wrong with this reaction? What would be the most likely product for this reaction?

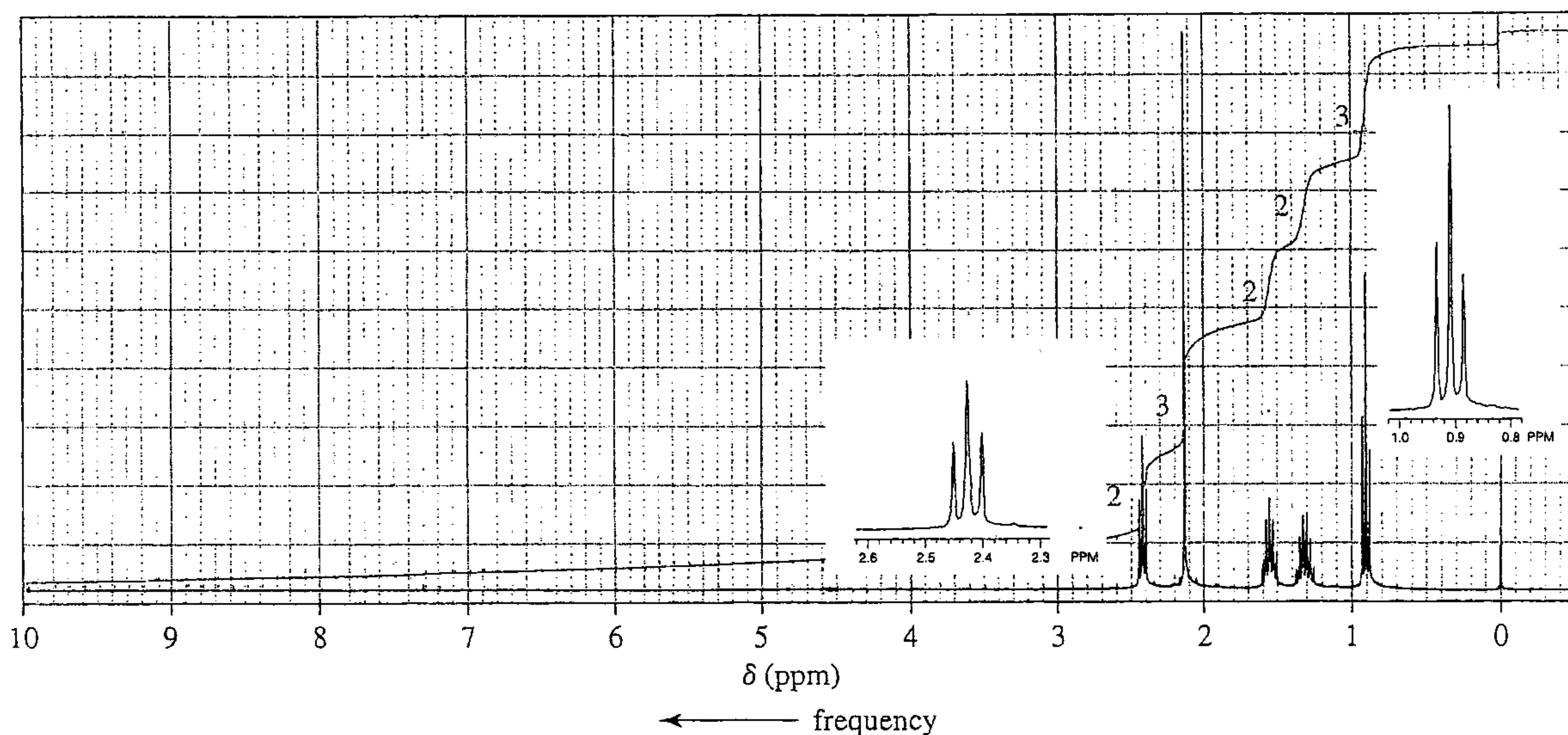
(10%)



六、(一) A compound with molecular formula $\text{C}_6\text{H}_{12}\text{O}_2$ has the following ^1H NMR spectrum.

Identify its molecular structure.

(5%)



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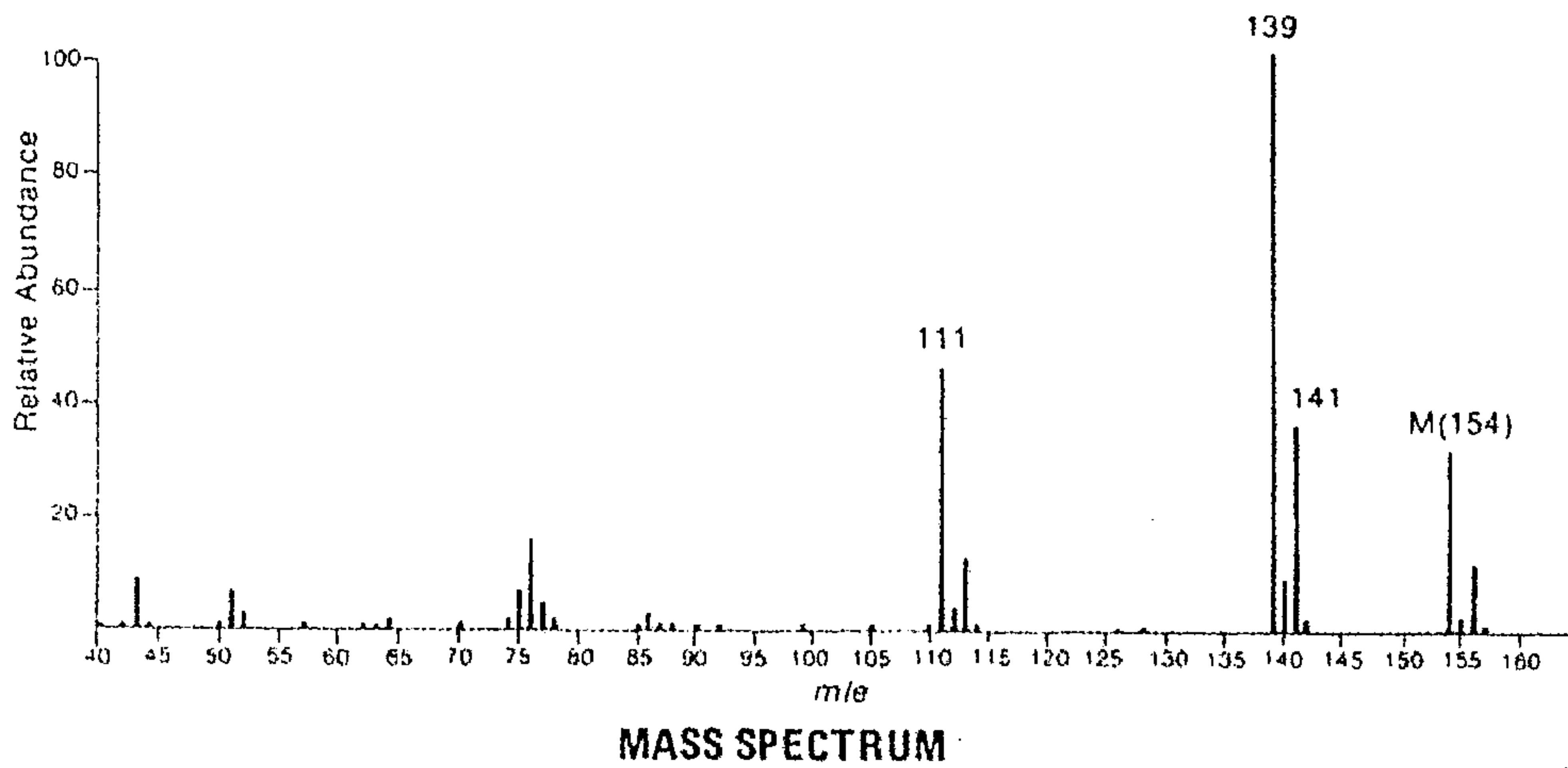
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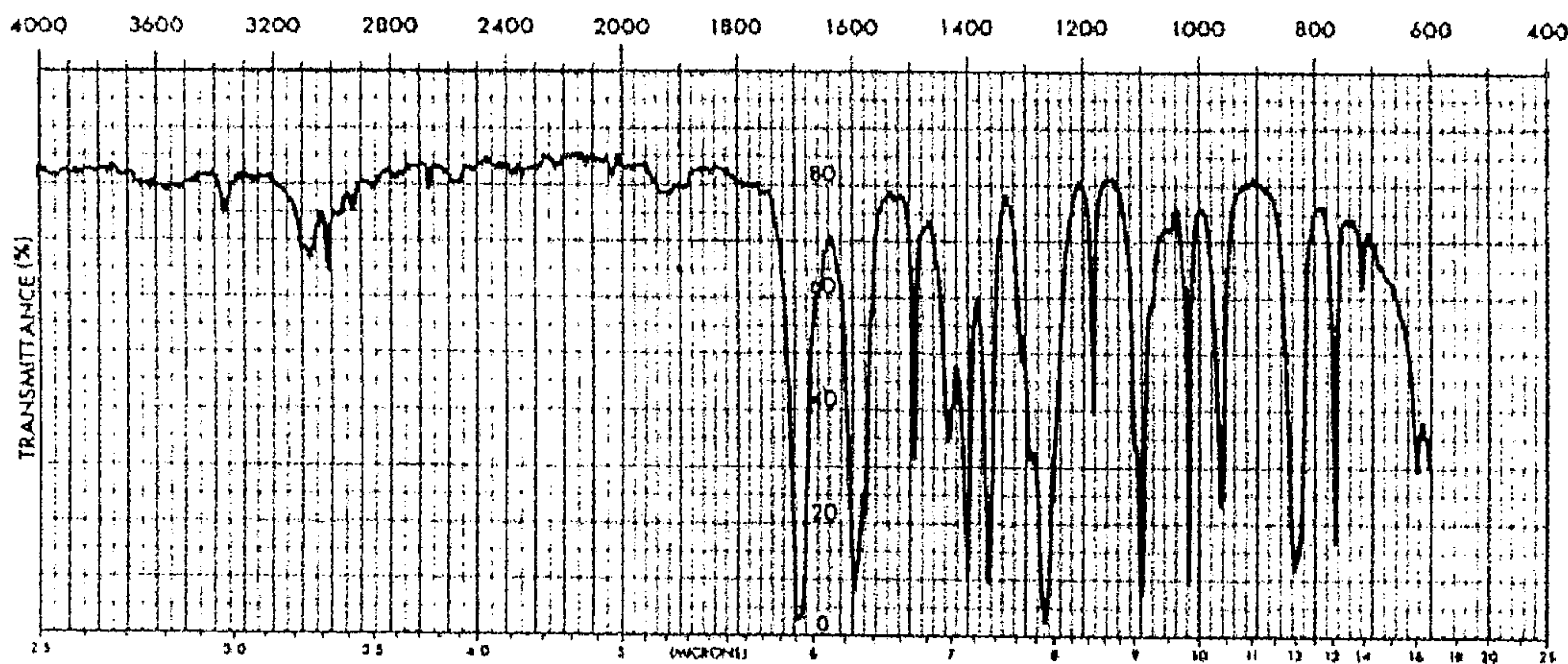
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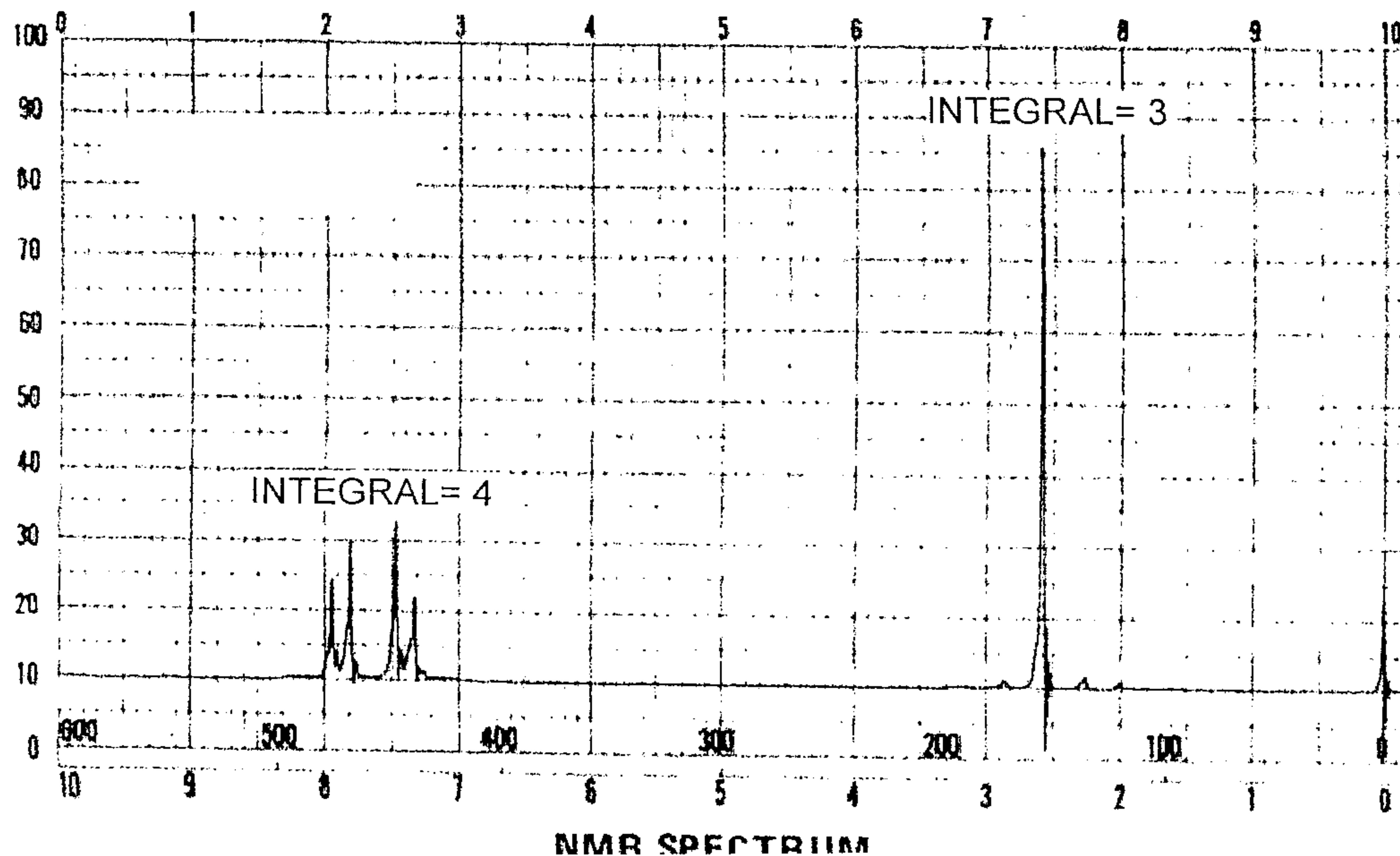
(二) Deduce molecular structure for the compound that matches with the following spectral data. (15%)



MASS SPECTRUM



INFRARED SPECTRUM



NMR SPECTRUM