

淡江大學八十八學年度碩士班招生考試試題

系列：化學學系

科目：有機化學

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I. Choose the best answer (15 points)

1. Correct IUPAC name

- a) 2-butyl alcohol b) *sec*-butyl alcohol c) 2-butanol d) 1-methyl-1-propanol

2. Strongest bond

- a) C-F b) C-Cl c) C-Br d) C-I

3. Soluble in aqueous sodium hydroxide

- a) $\text{CH}_3(\text{CH}_2)_6\text{CH}_2\text{OH}$ b) $\text{CH}_3(\text{CH}_2)_6\text{CH}_2\text{SH}$ c) $\text{CH}_3(\text{CH}_2)_6\text{CH}_2\text{NH}_2$
d) $\text{CH}_3(\text{CH}_2)_6\text{CH}_3$

4. "Pseudorotates"

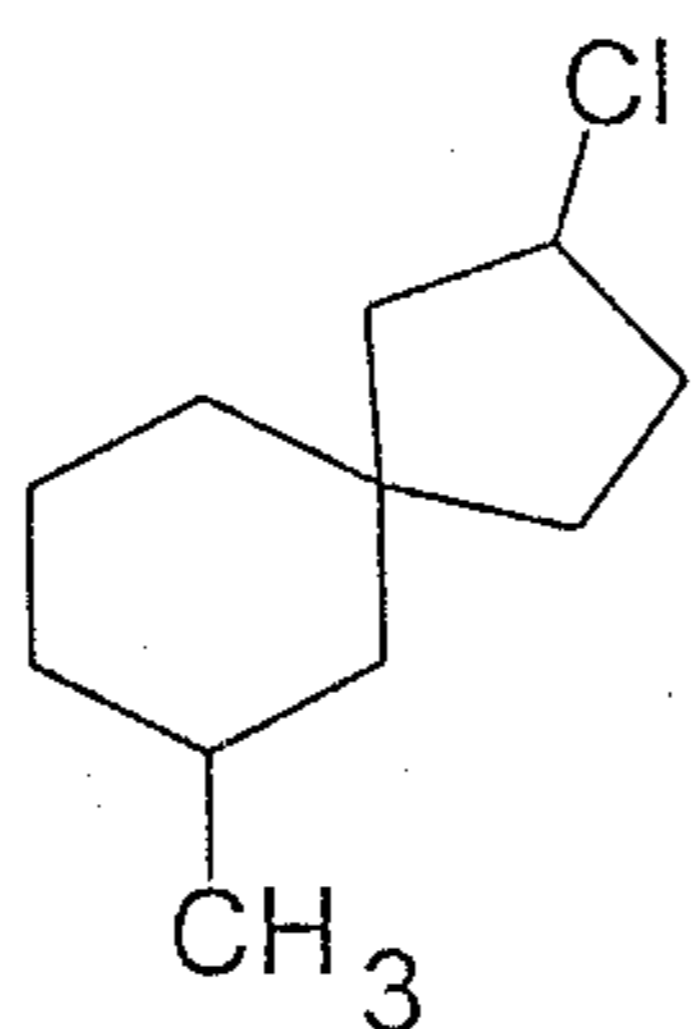
- a) cyclohexane b) trimethylamine c) cyclopentane d) butane

5. Compared to butane, the C-C bonds of cyclobutane have more

- a) s character b) p character c) bond strength d) electron density

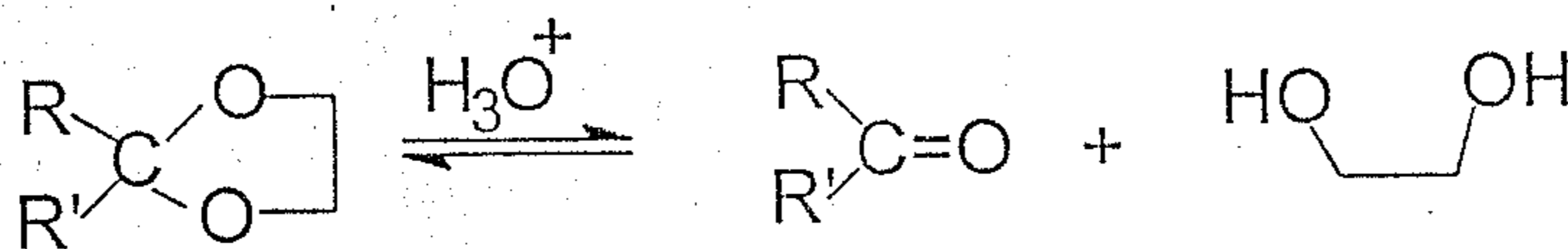
II. Conformation and Stereochemistry (12 points)

1. Draw a Newman projection of *gauche* butane
2. Draw a 3-D structure of (S)-3-bromocyclohexanone
3. Draw the 3-D structure of the following spiro-compound:

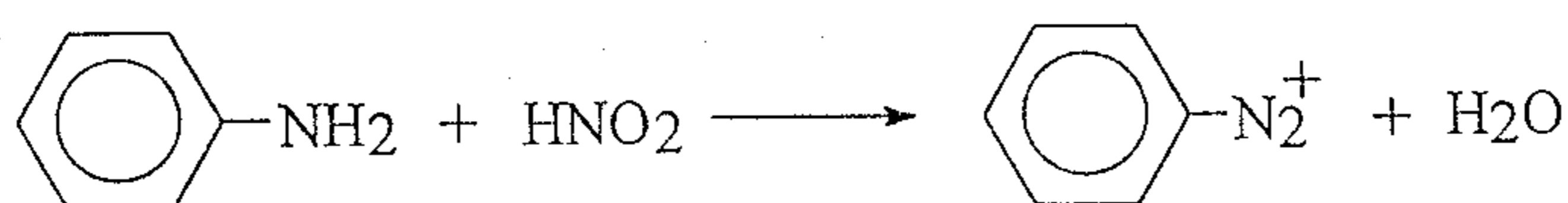


III. Provide a detailed electronic mechanism for the following reactions. Indicate the electron flow with an arrow. (16 points)

1.



2.



◀ 注意背面尚有試題 ▶

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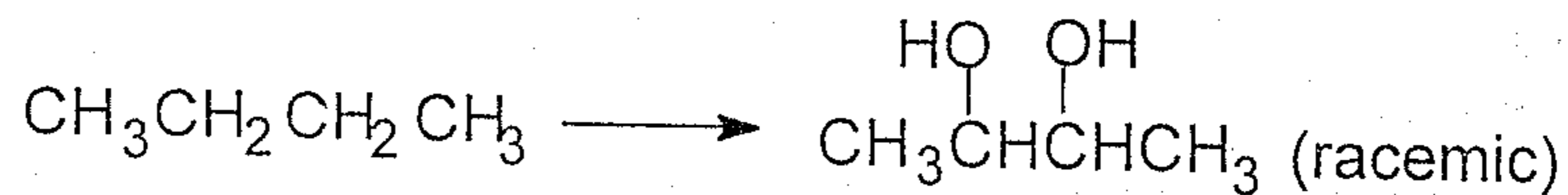
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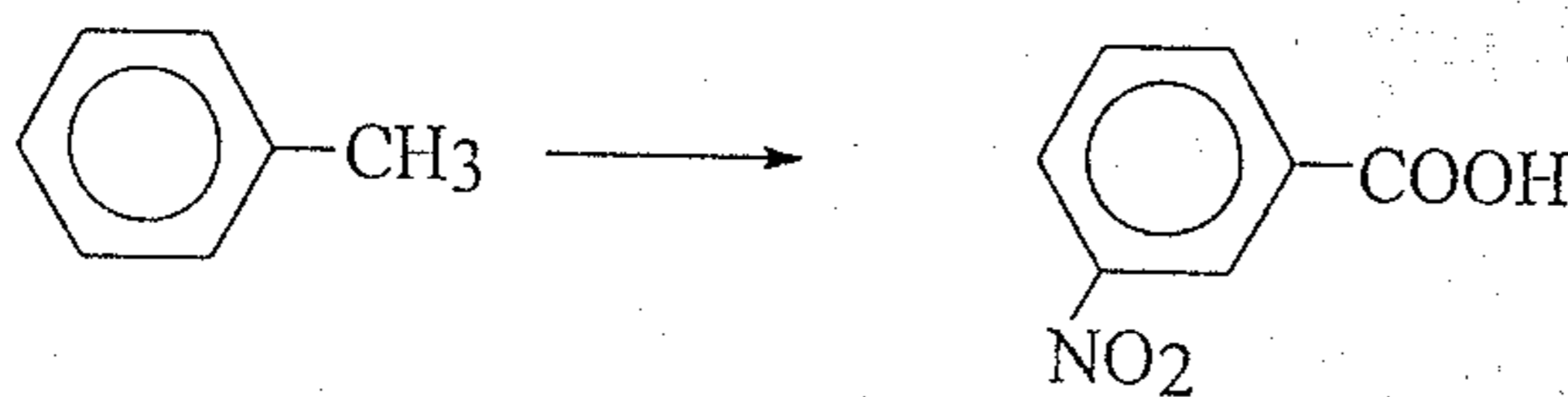
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IV. Synthesize the following compound from the starting material provided and any other necessary inorganic reagents. (32 points)

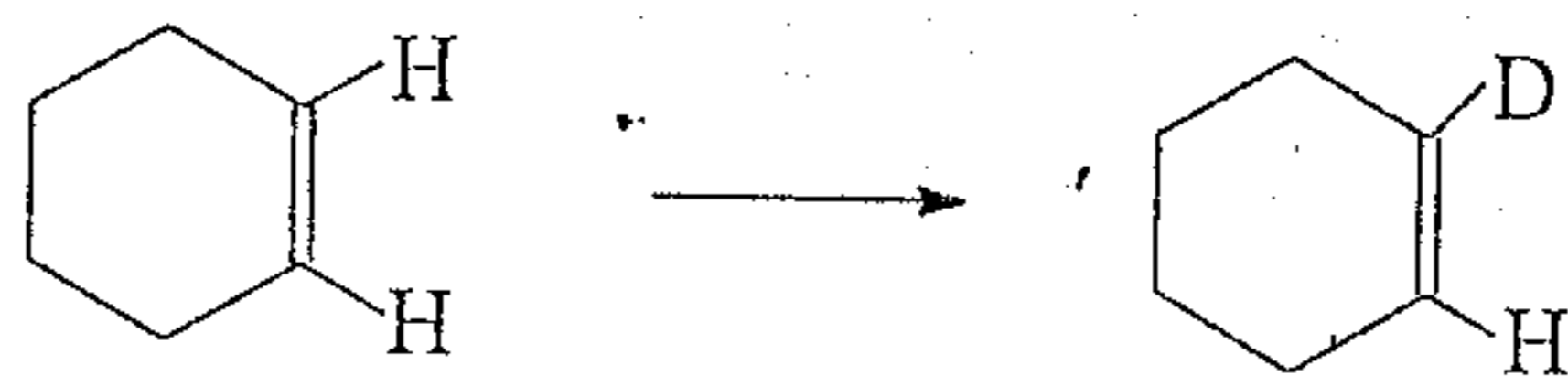
1.



2.



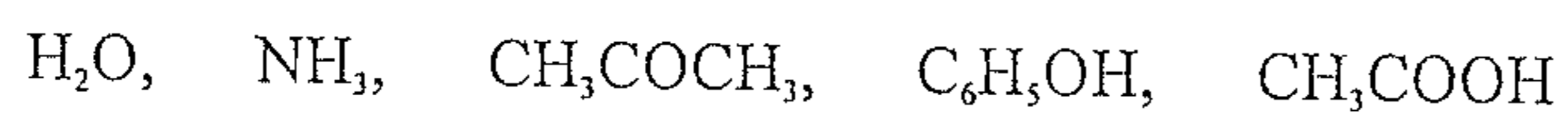
3.



4.

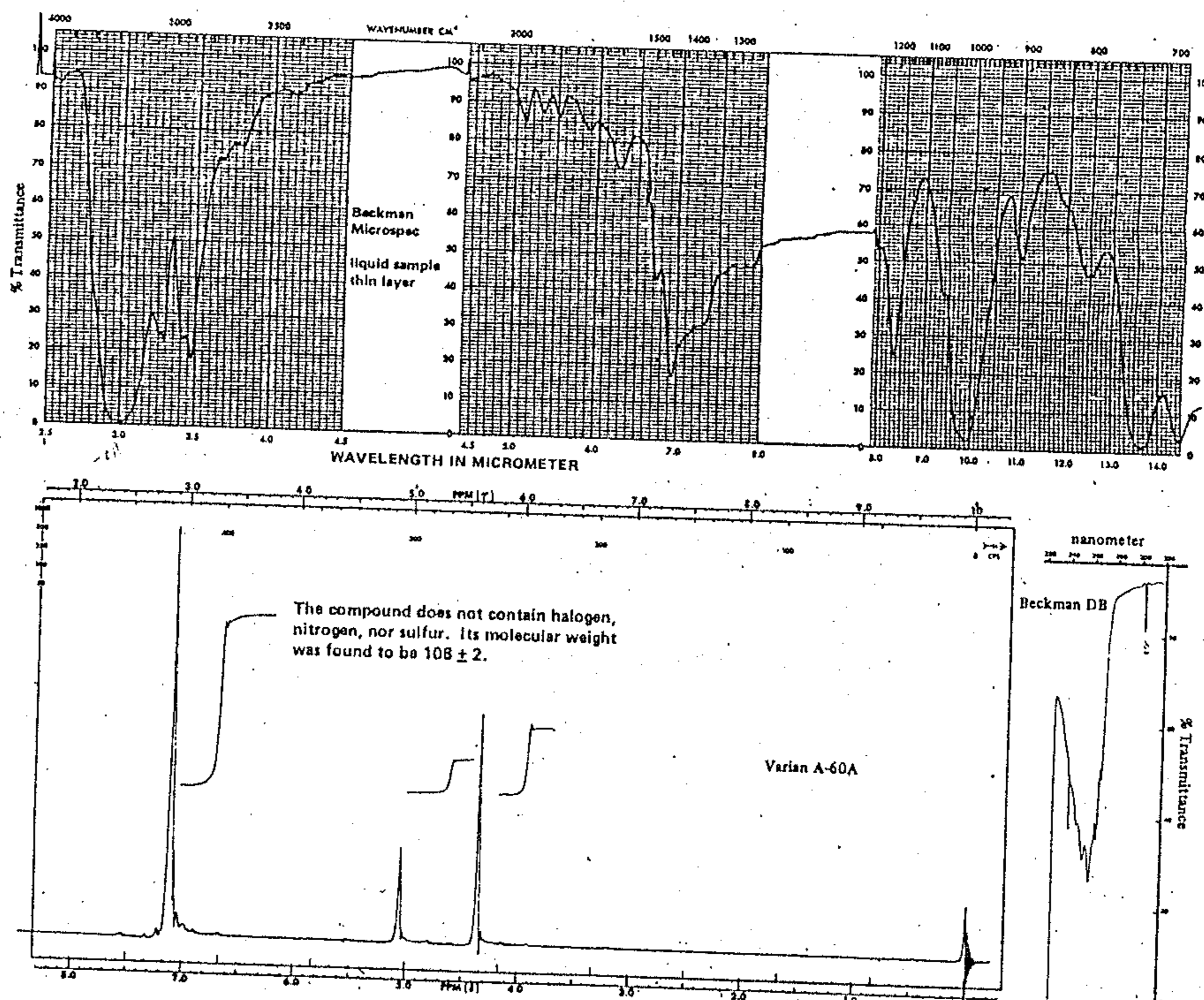


V. Give the pKa values (roughly) of the following compounds: (10 points)



VI. On the basis of spectra provided, deduce the structure of the unknown compound.

1. (5 points)



◀ 注意背面尚有試題 ▶

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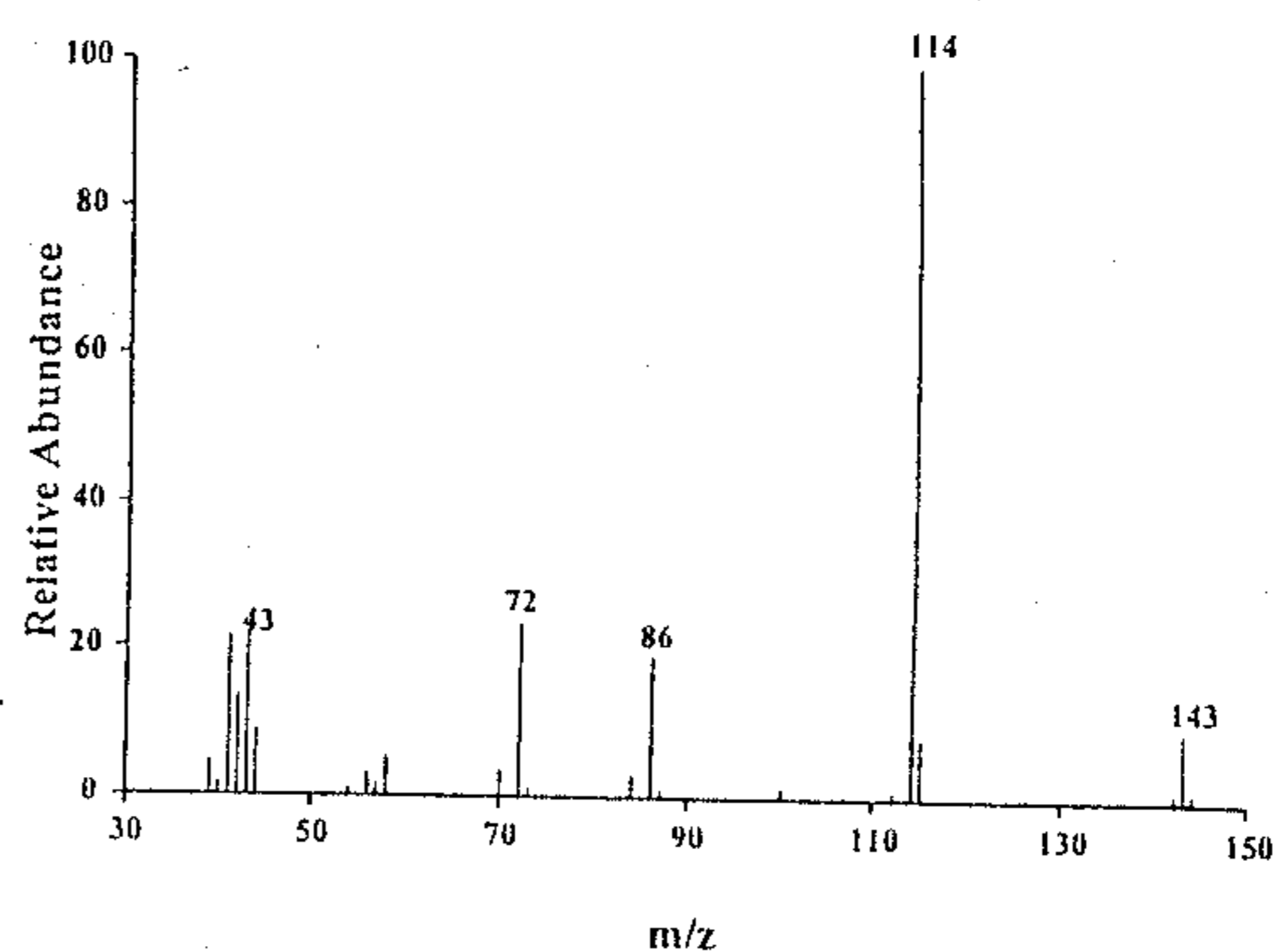
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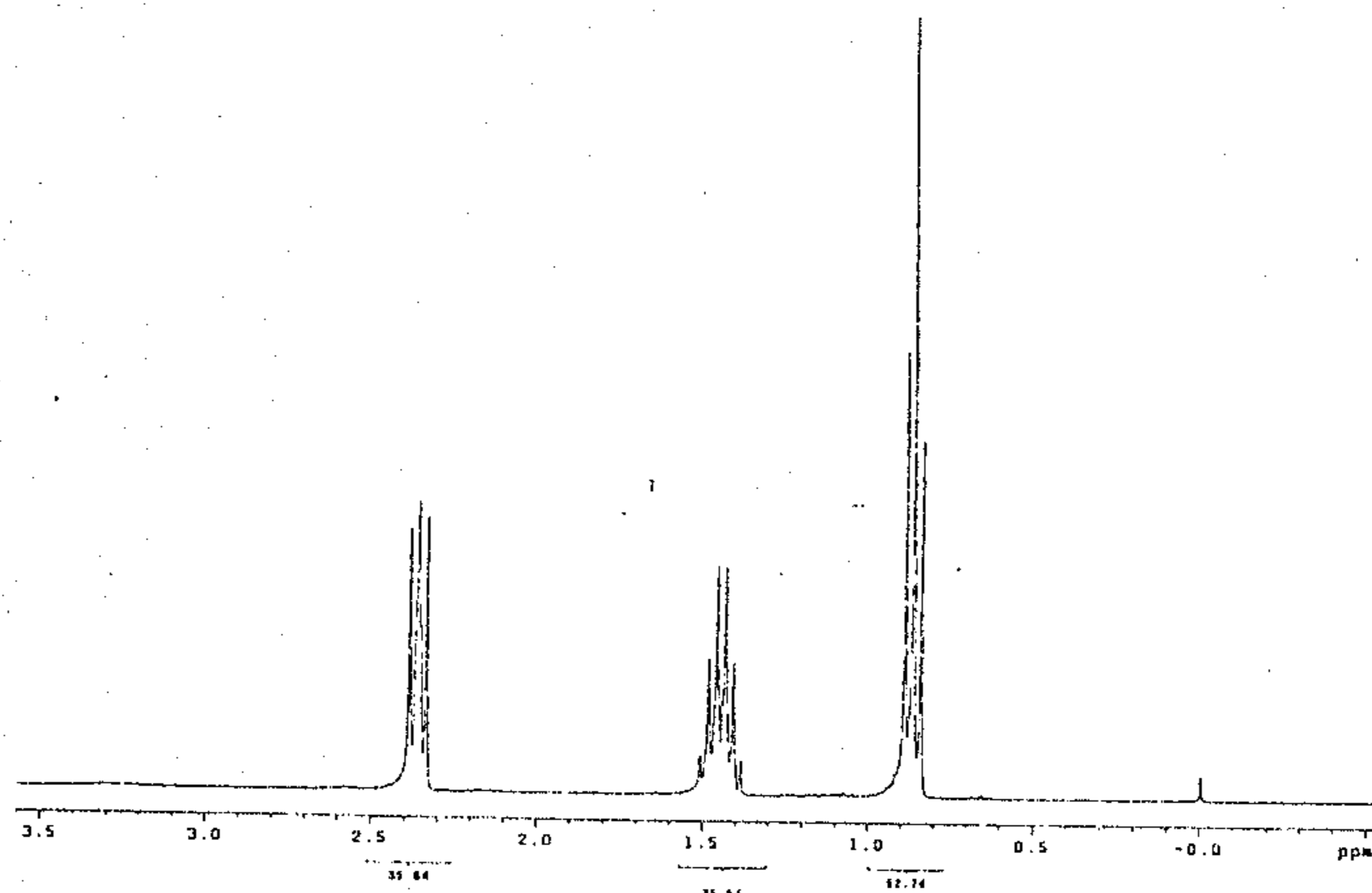
VI.

2. (10 points)

Mass spectrum (EI)



Proton NMR spectrum (CDCl₃)



Carbon-13 NMR spectrum

