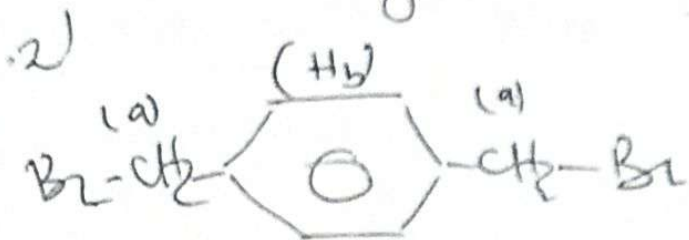


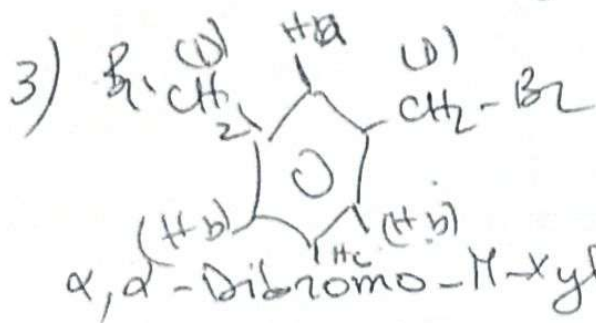
1,2-Dimethylbromo Benzene.

$H_a$  (2H) ave  $H_b$  → doublet  
 $H_b$  (1H) ave  $H_a$  triplet  
 $H_c$  : singulet.



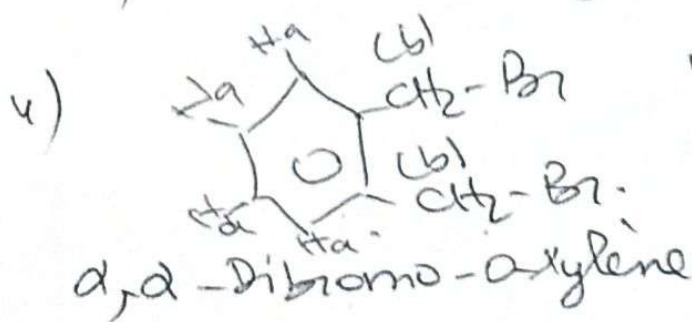
$\alpha, \alpha$ -Dibromo-p-xylene.

$H_a$  (4H) singulet  
 $H_b$  (4H) singulet



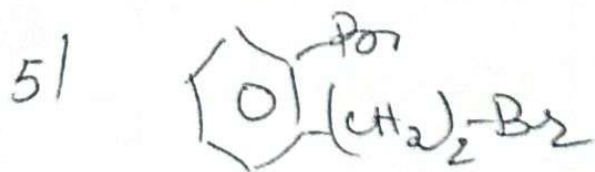
$\alpha, \alpha$ -Dibromo-m-xylene.

( $H_a$ ) singulet (1H)  
 ( $H_b$ ) singulet (2H)  
 ( $H_c$ ) doublet (2H)  
 ( $H_c$ ) doublet de doublet.

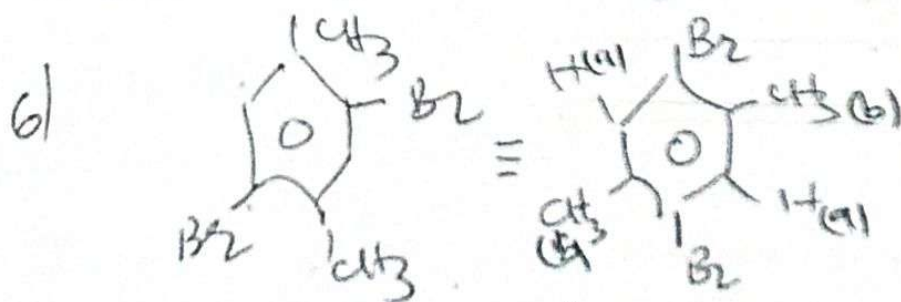
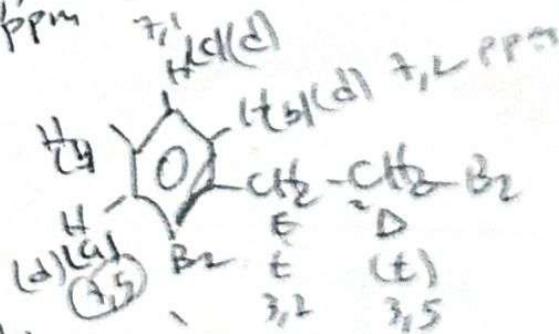


$\alpha, \alpha$ -Dibromo-o-xylene.

46 ppm ( $H_b$ ) singulet (4H)  
 73 ppm ( $H_a$ ) singulet (4H)



1-Bromo-2-(2-bromomethyl) benzene



2,5-Dibromo-p-xylene

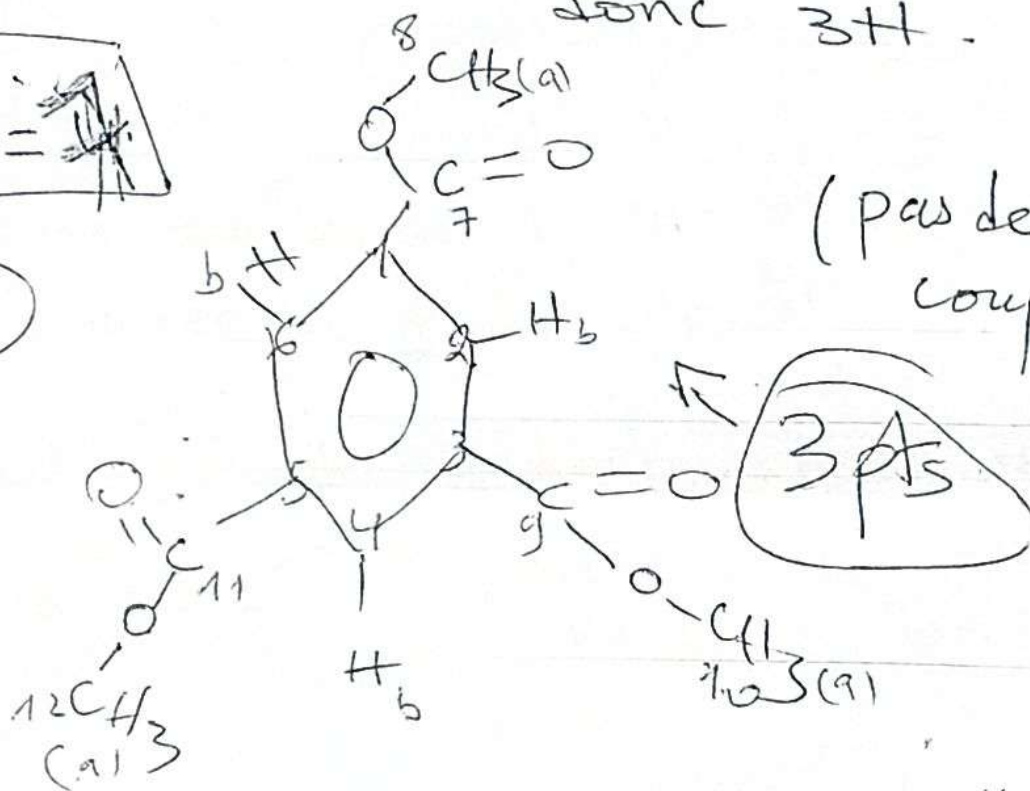
2 signaux,  $H_a$ ,  $H_b$   
 $H_a$  singulet intensité 2  
 7.1, 7.2 ppm  
 $H_b$  (6H)  
 2, 3.1 ppm

$\delta = 4,3 \text{ ppm}$  ( $9 \text{ H}$ ) ( $\text{O-CH}_3$ )  
 $= 0 \text{ } 3 (\text{O-CH}_3)$

$\delta = 9,1 \text{ ppm}$  ( $\text{H}_b$  aromatique)  
 donc 3H.

DI = ~~4~~

1 pt



(pas de couplage)

3 pts

2 pts

$\text{C}_1$ : s (singulet)

$\text{C}_2$ : d (doublet)

$\text{C}_3$ : s

$\text{C}_4$ : d

$\text{C}_5$ : s

$\text{C}_6$ : d

$\text{C}_7$ : s

$\text{C}_8$ : q (quadruplet)

$\text{C}_9$ : s

$\text{C}_{10}$ : q

$\text{C}_{11}$ : s

$\text{C}_{12}$ : q

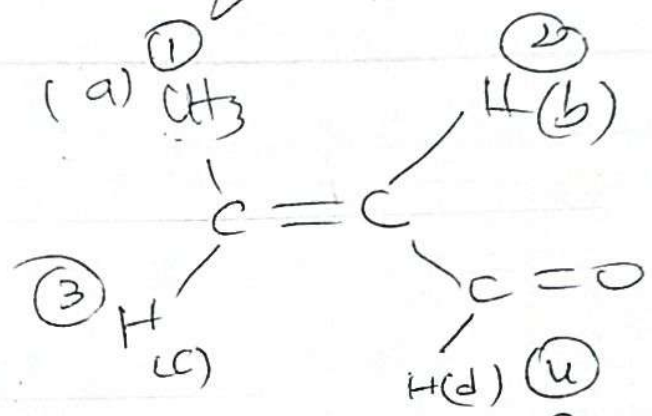
03 (.8 pts)

C<sub>4</sub>H<sub>6</sub>O

1 pt attribution des numéros

DI = 2

0,5 pt

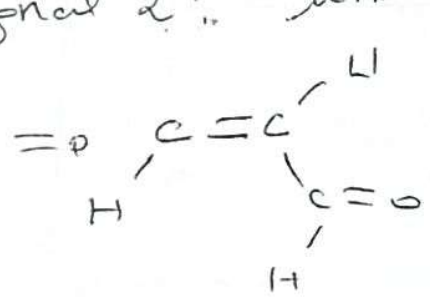


2 pts

RMN<sup>1</sup>H

4 signaux ⇒ signal 1 : s = 2,03 → CH<sub>3</sub>  
 couple avec -C-H ⇒ doublet.

\* signal 2 : un multiplet - s = 6,05



(présence d'oxygène)  
 vu le δ (ppm)

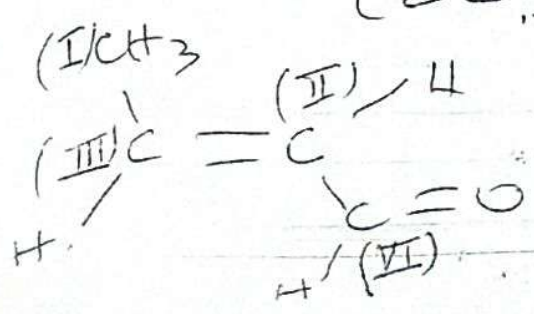
\* signal 3 : un multiplet confirmé par le premier signal. s = 6,9 ppm.

donc les CH<sub>3</sub> sur une (=)  
 (système AMX) ⇒ 16 raies

\* signal 4 : s = 6,9 ppm. H<sub>d</sub> couple avec H<sub>b</sub> et H<sub>c</sub> donc H<sub>d</sub>c=O.

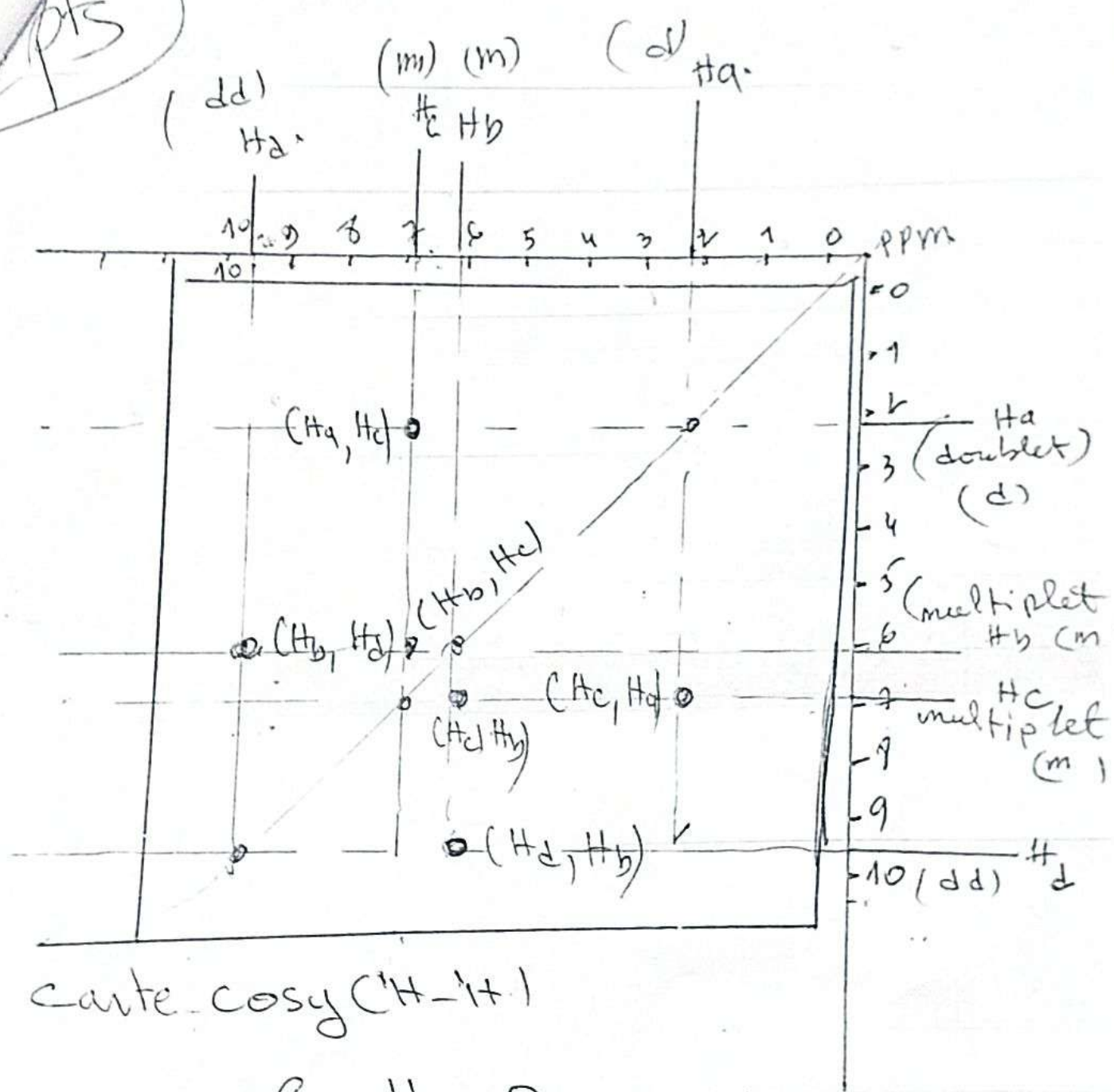
(dd)

RMN<sup>13</sup>C



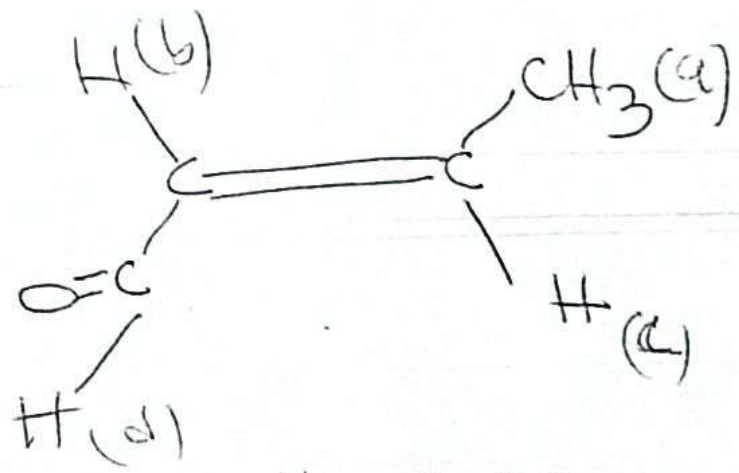
2 pts

pts



carte cosy (H-H)

Cu H6 0



but-2-enal  
1,5 pts

$H_a = 2,05 \text{ ppm}$      $H_c = 6,9 \text{ ppm}$   
 $H_b = 6,05 \text{ ppm}$      $H_d = 9,65 \text{ ppm}$