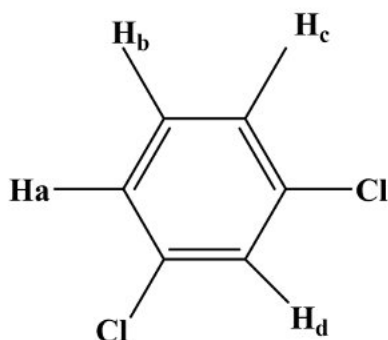




TD N° 4 Spectroscopie de RMN

Exercice 1 :

Designer dans les exemples suivants les ensembles équivalents de protons par les lettres a, b, c :



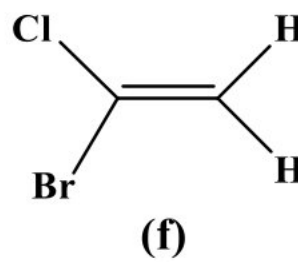
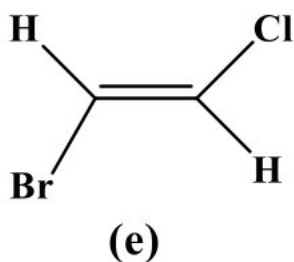
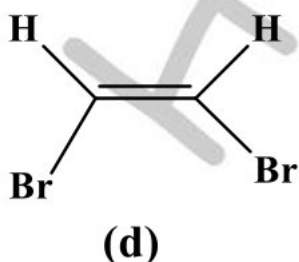
Exercice 2 :

- Représenter les formuls des structures des composés suivants qui présenteraient un singulet en RMN¹H?
a) C_5H_{12} ; b) C_3H_6 ; c) $\text{C}_2\text{H}_6\text{O}$; d) C_4H_6 ; e) C_3H_4 .
- Représenter les formuls des structures des composés suivants qui présenteraient deux singulet en RMN¹H?
a) $\text{C}_3\text{H}_5\text{Cl}_3$; b) $\text{C}_2\text{H}_5\text{OCl}$; c) $\text{C}_3\text{H}_8\text{O}_2$; d) $\text{C}_5\text{H}_{10}\text{Br}_2$; e) $\text{C}_3\text{H}_6\text{O}_2$.

Exercice 3 :

Parmi les molécules suivantes, quelles sont celles qui donnent un couplage spin-spin? S'il se produit un couplage, quelle sera la multiplicité de chaque proton?

- a) $\text{ClCH}_2\text{-CH}_2\text{Cl}$; b) $\text{ClCH}_2\text{-CH}_2\text{I}$; c) $(\text{CH}_3)_3\text{C-CH}_2\text{Br}$.



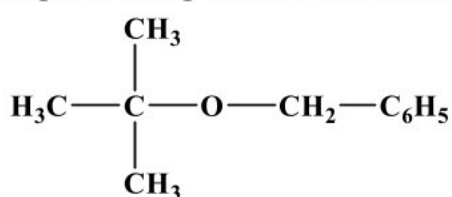
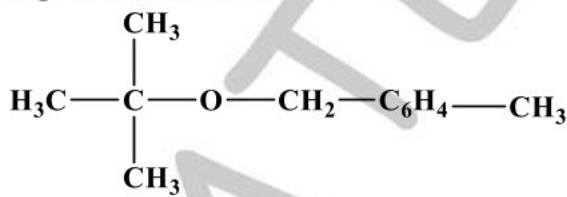
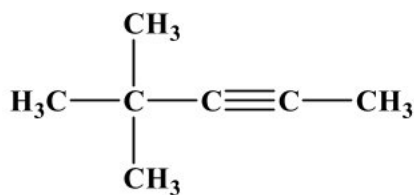
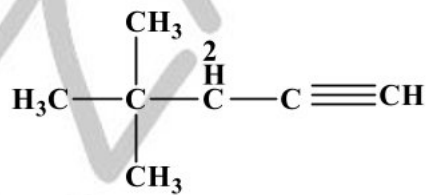
**Exercice 4 :**

Donner une représentation schématique de spectre de RMN proton montrant l'intégration des molécules suivantes :

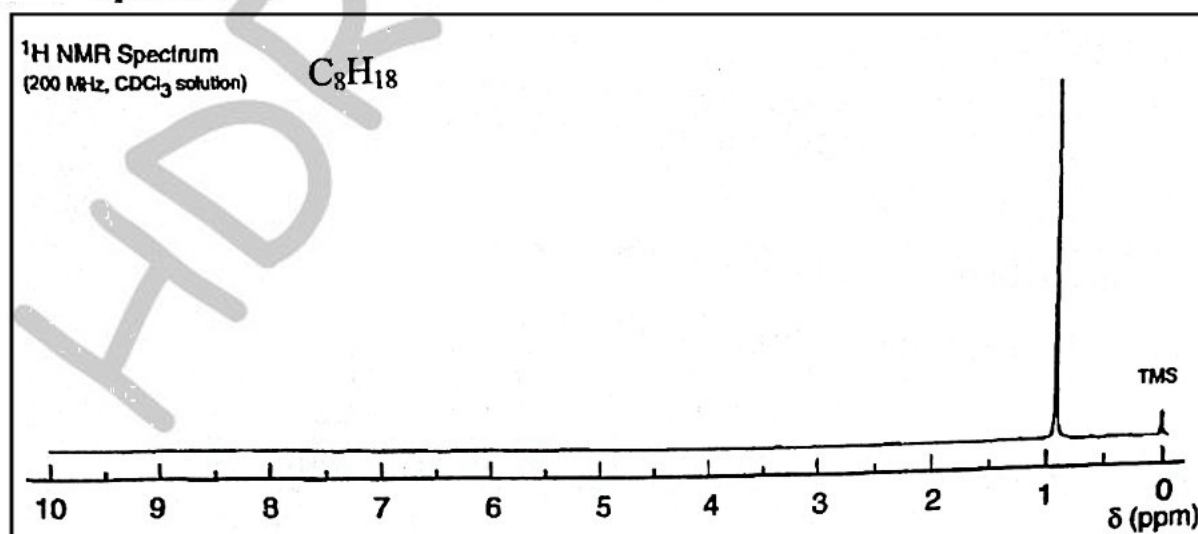
- a) Dichloro-1,1éthane ; b) Trichloro-1,1,2éthane ; c) Tetrachloro-1,1,2 éthane ; d) Bromo-1, Chloro-2 éthane .

Exercice 5 :

Quelle différence peut-on prévoir pour les paires d'isomères suivantes dans le spectre de RMN¹H quant à la position et l'intensité des pics de résonance.

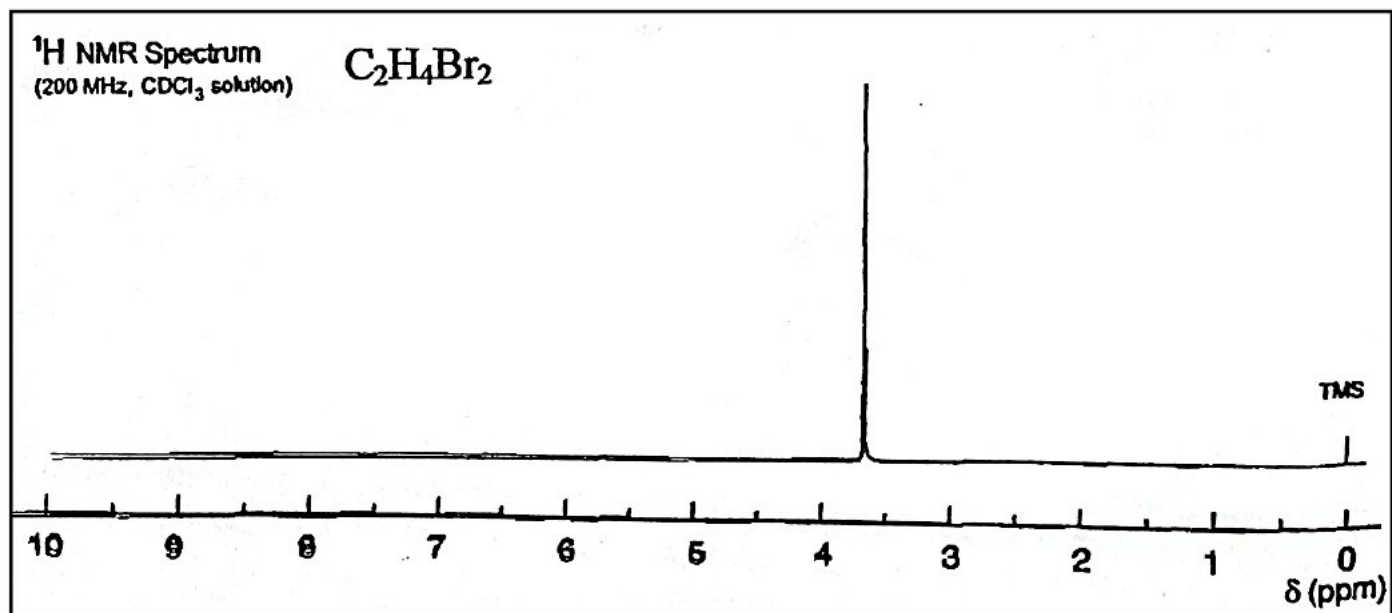
**a****a'****b****b'****Exercice 6 :**

En basant sur le spectre de RMN¹H, donner la formule développée pour chacune des molécules suivantes en attribuant les signaux correspondants.

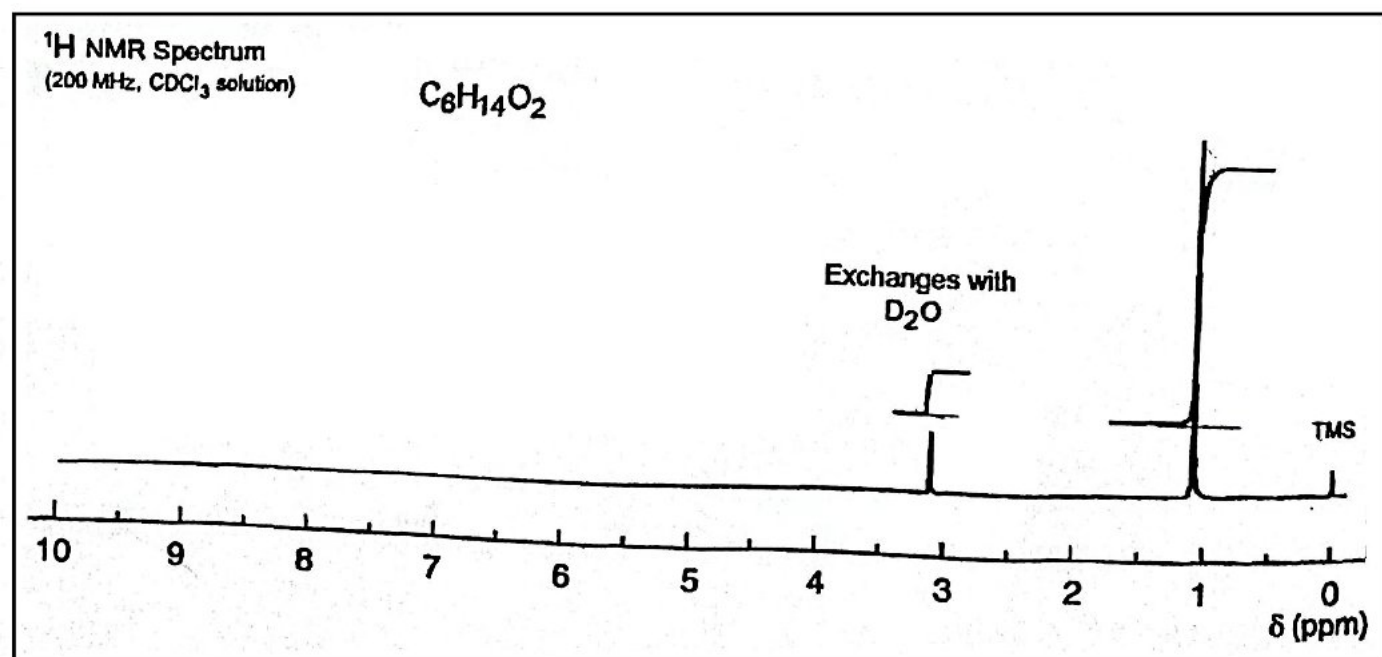
Spectre 1



Spectre 2

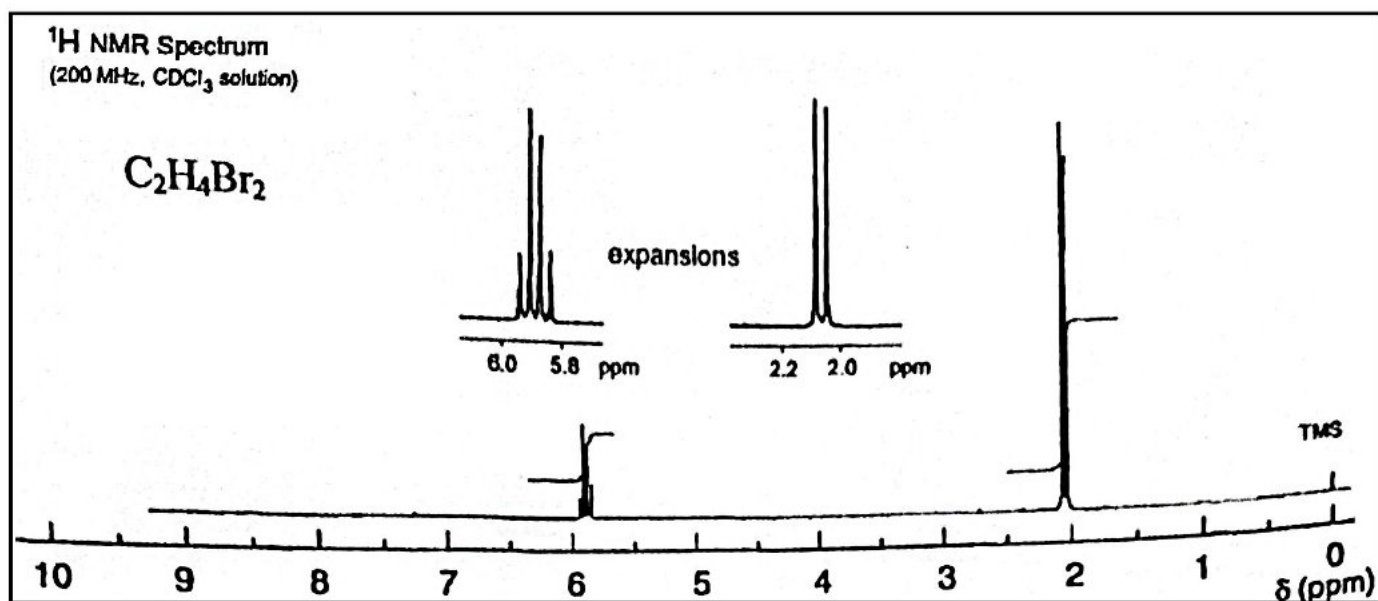


Spectre 3

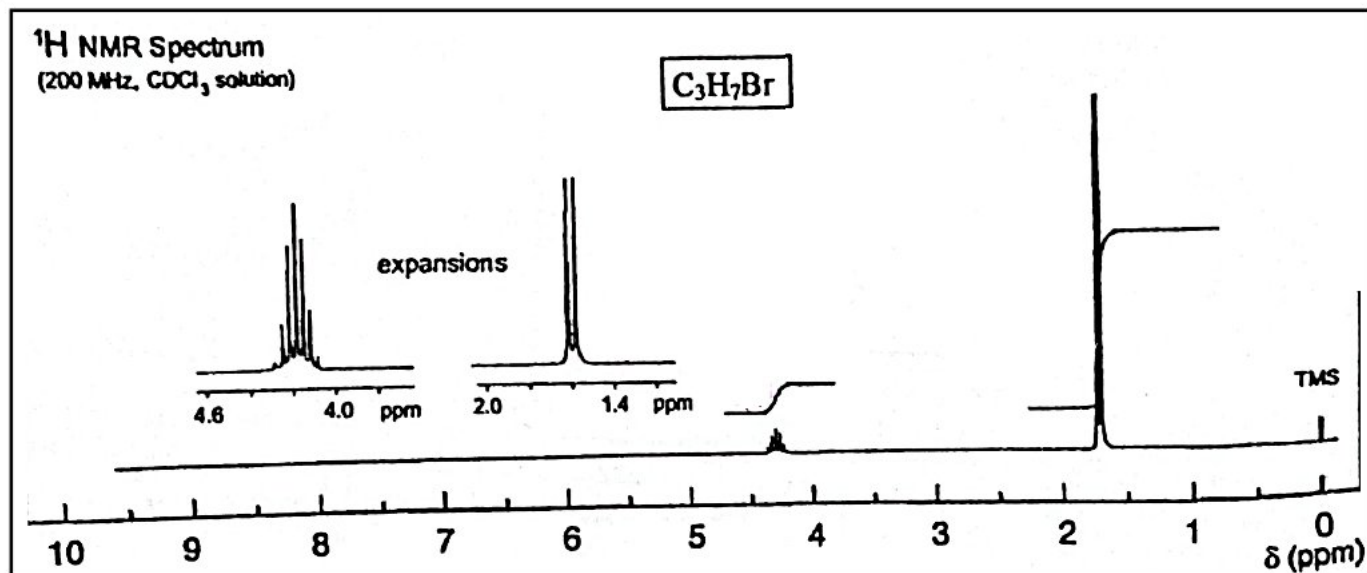




Spectre 4

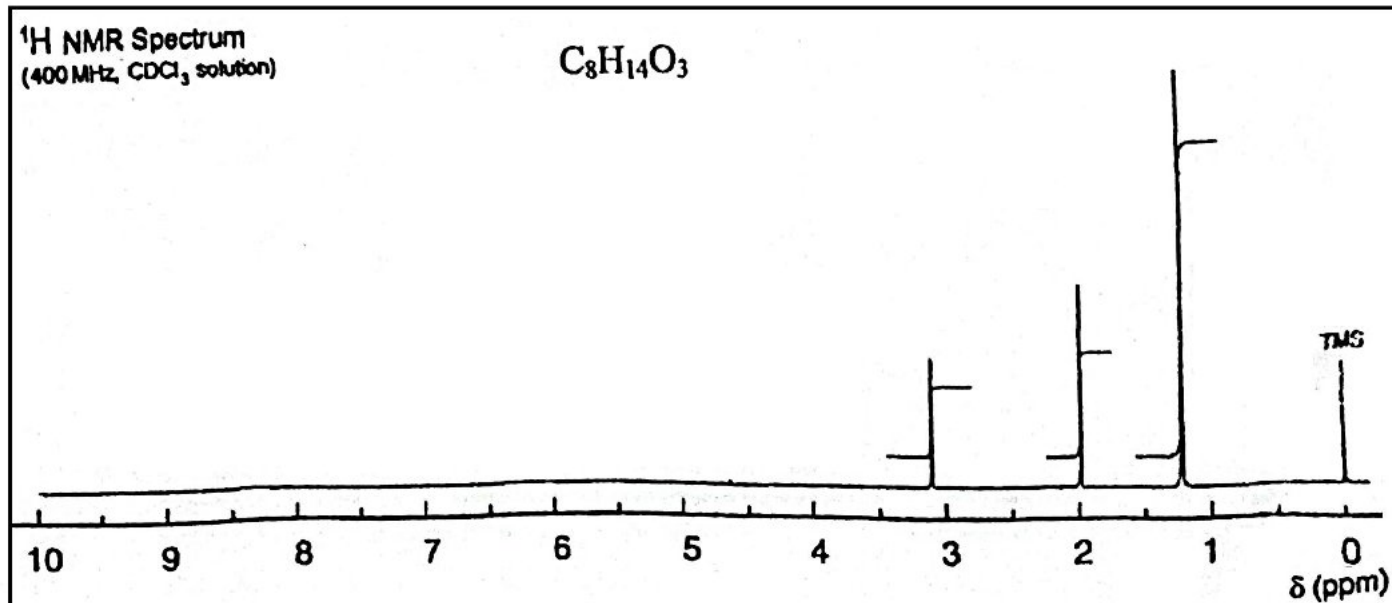


Spectre 5

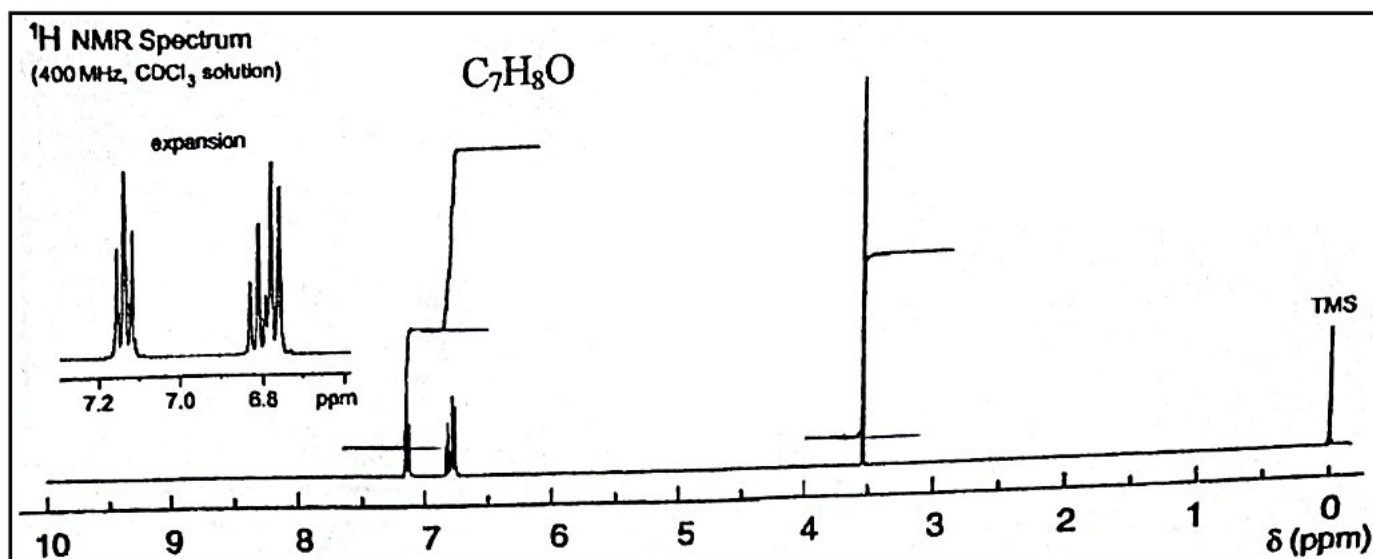




Spectre 6

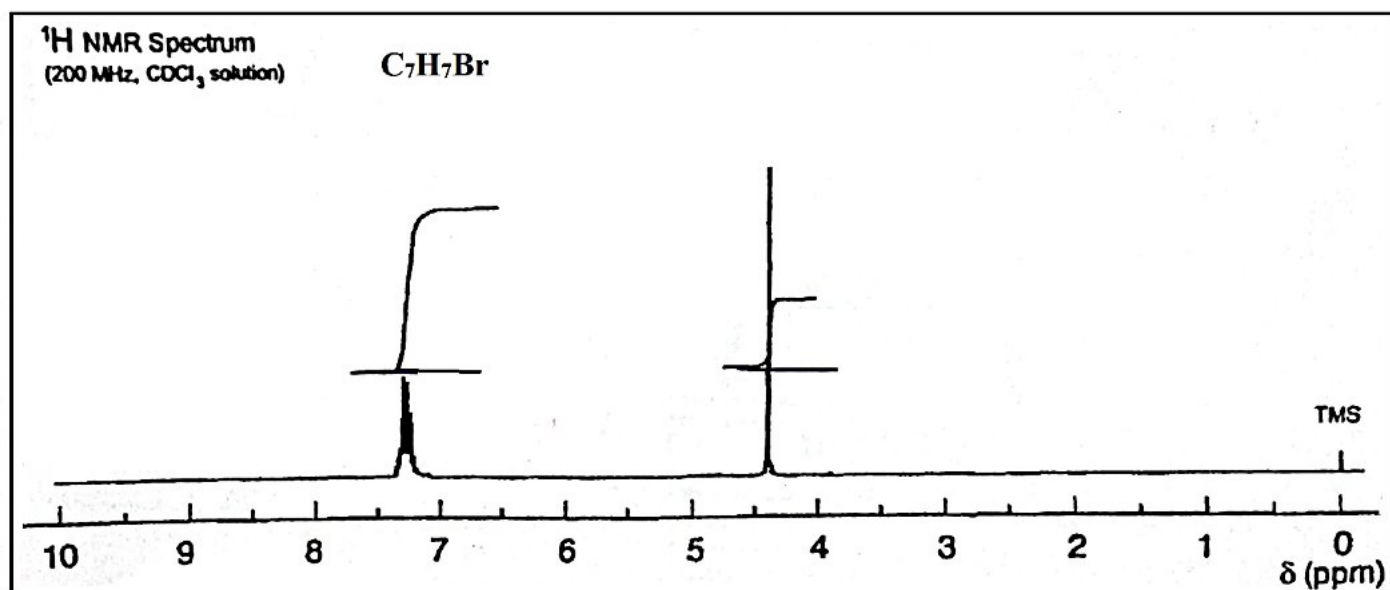


Spectre 7

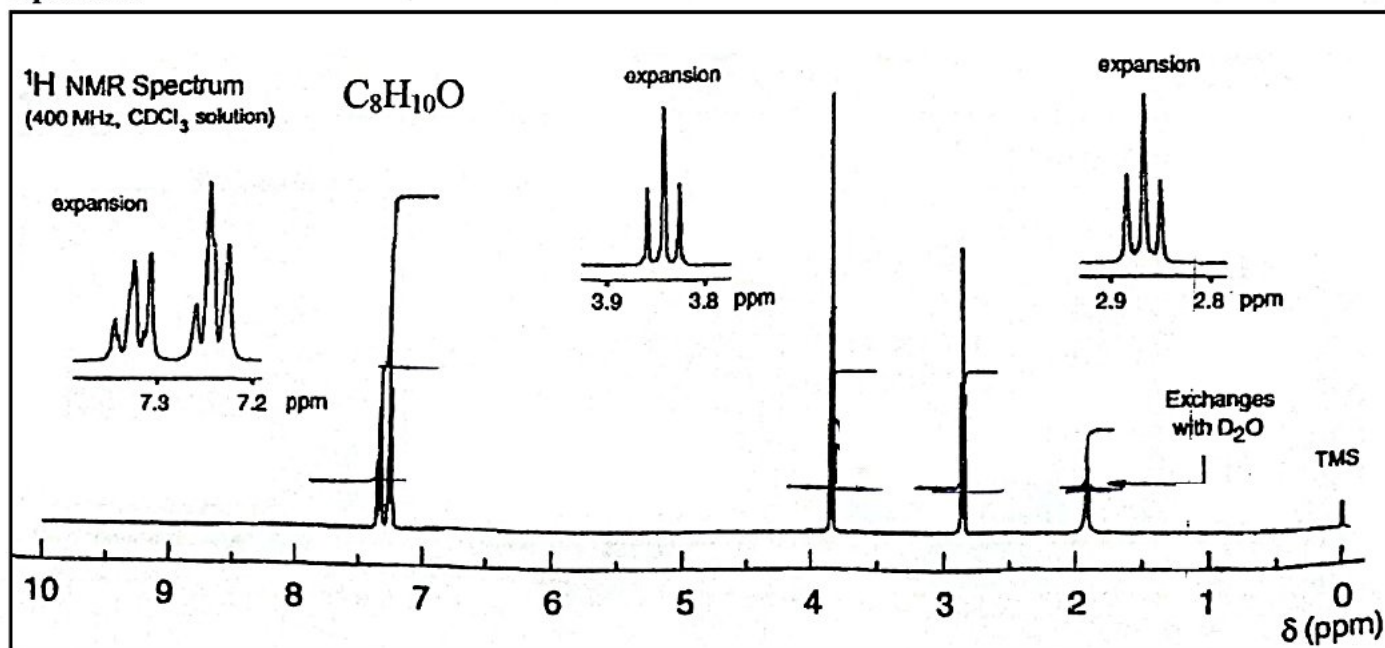




Spectre 8

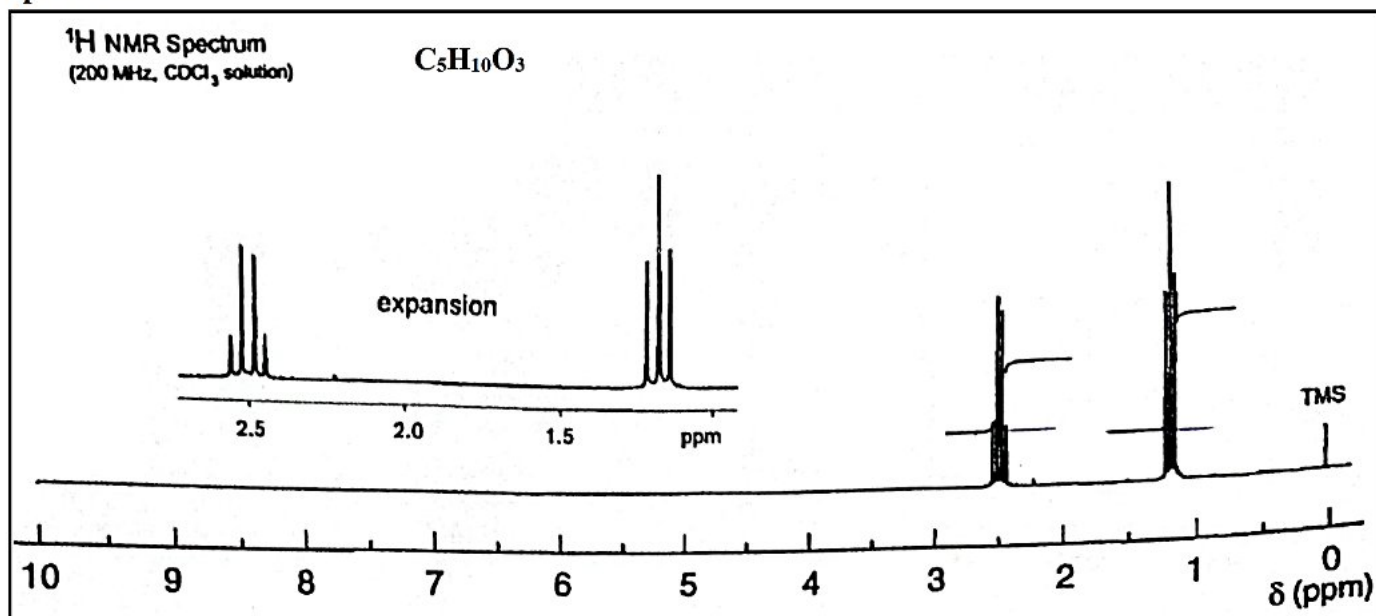


Spectre 9

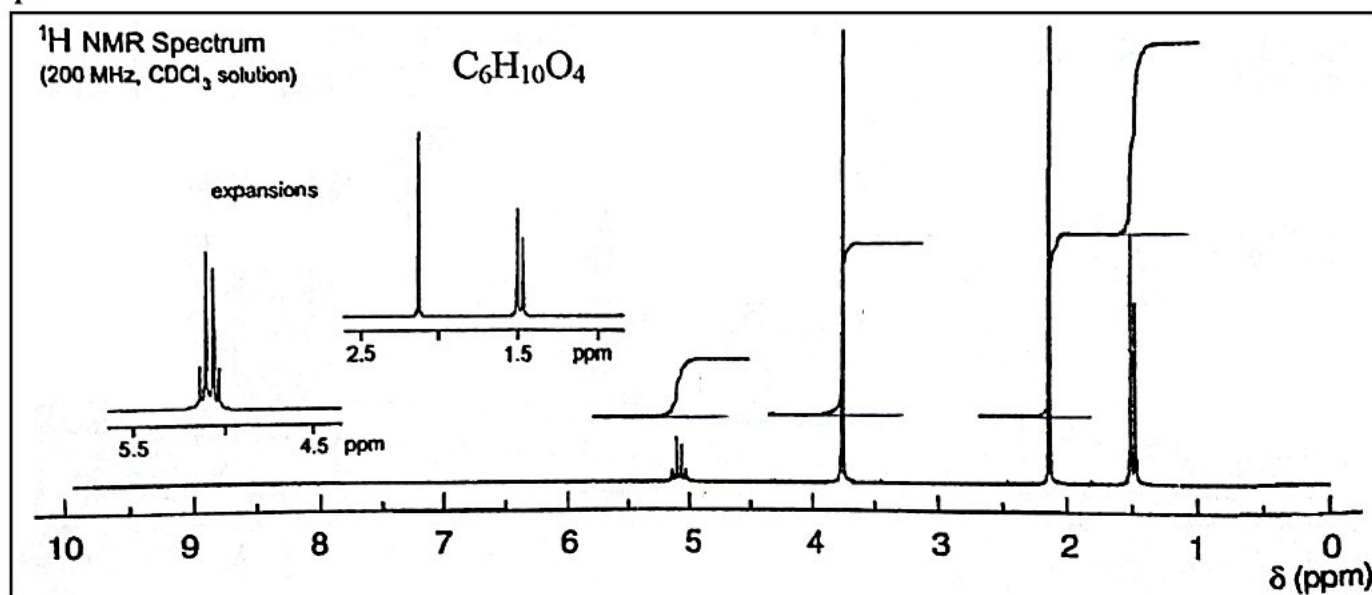




Spectre 10

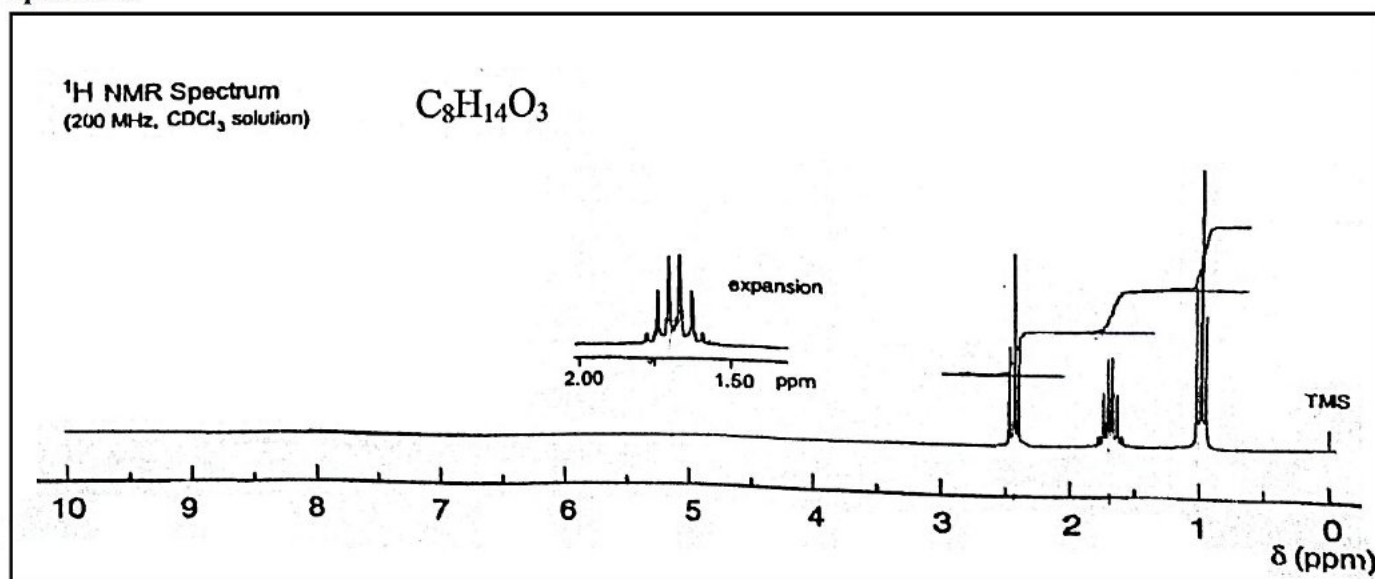


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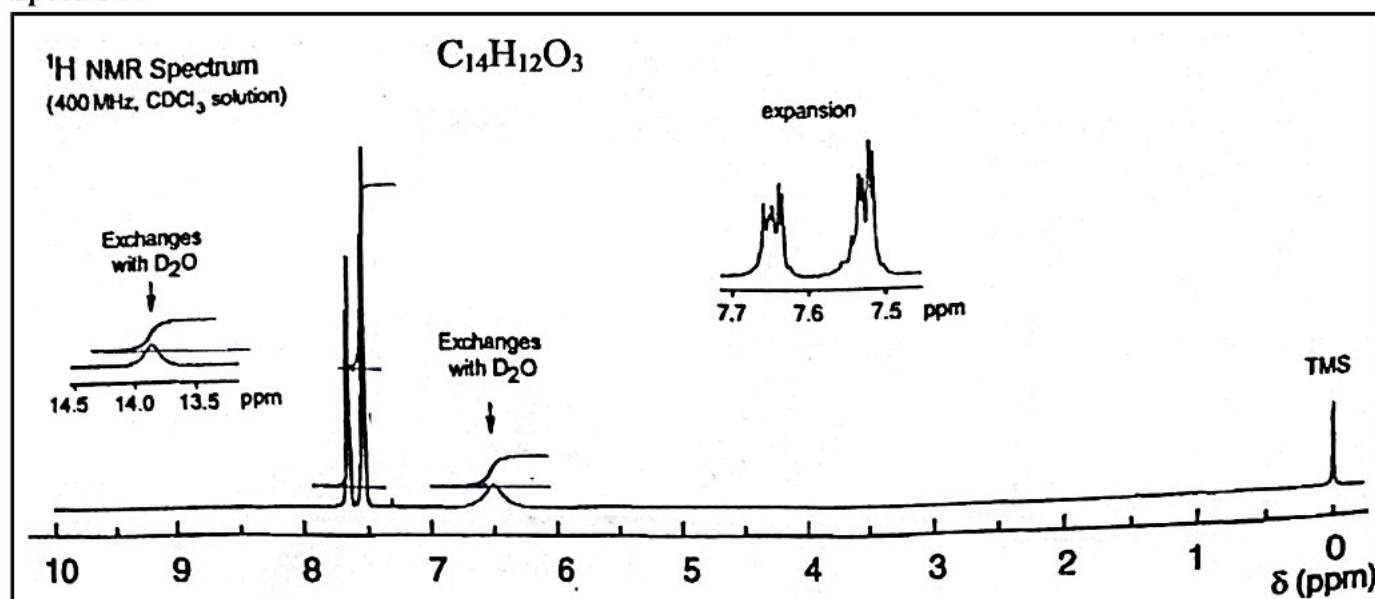




Spectre 12

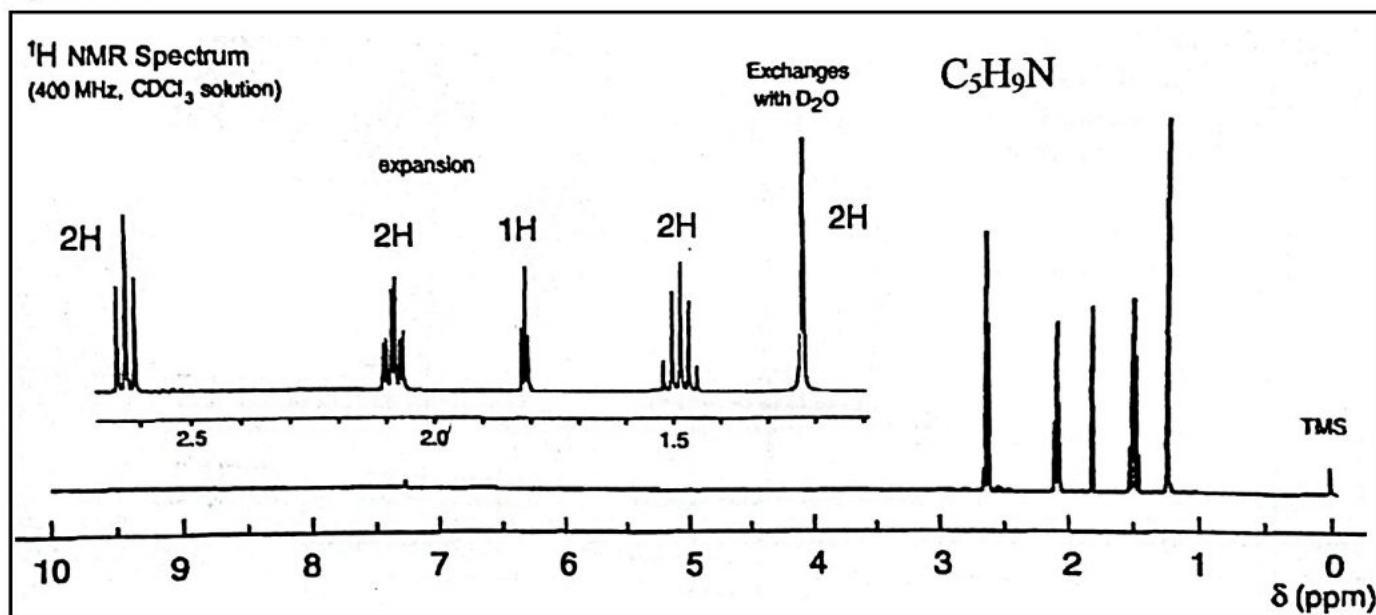


Spectre 13

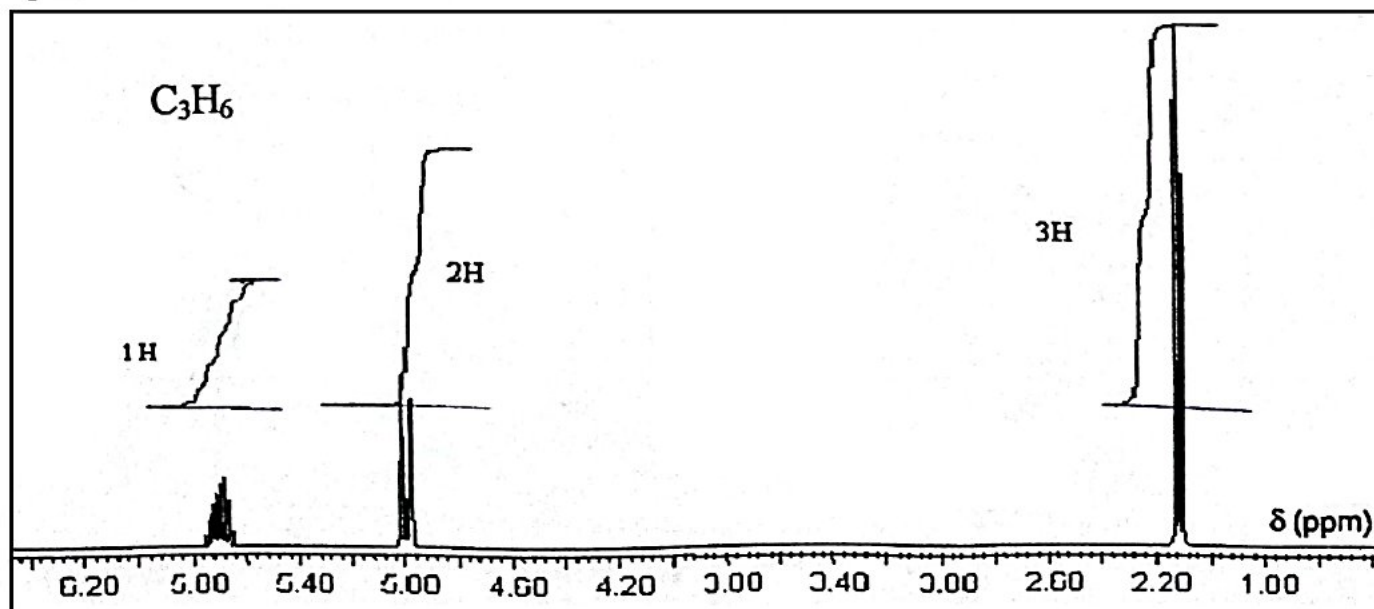




Spectre 14

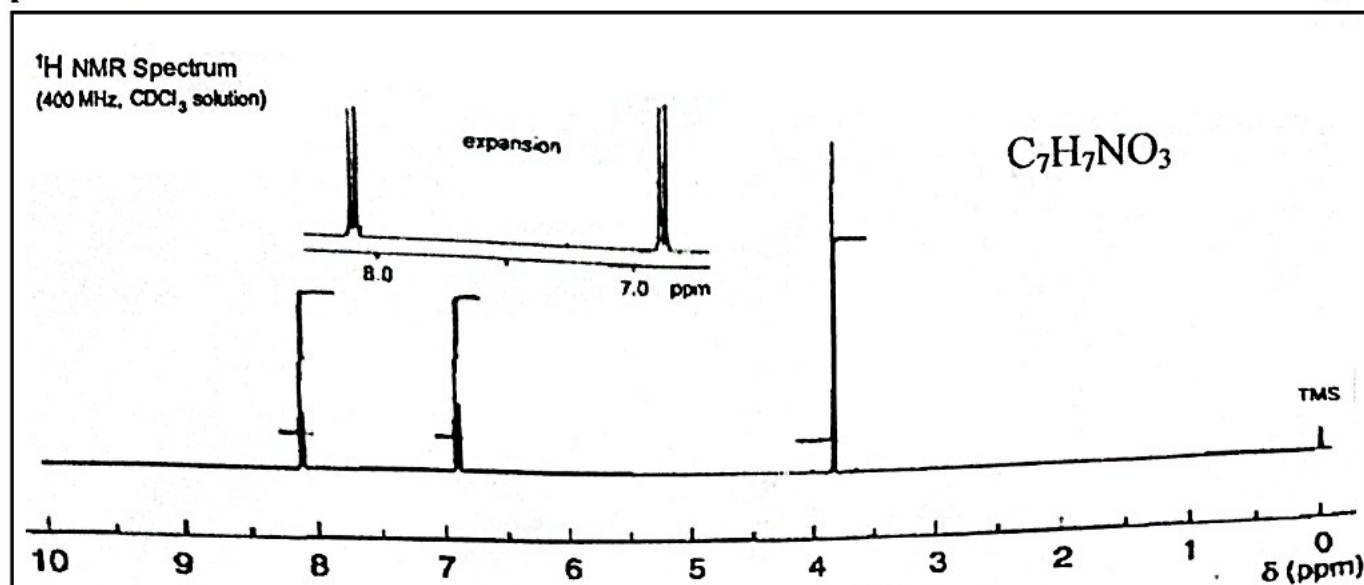


Spectre 15

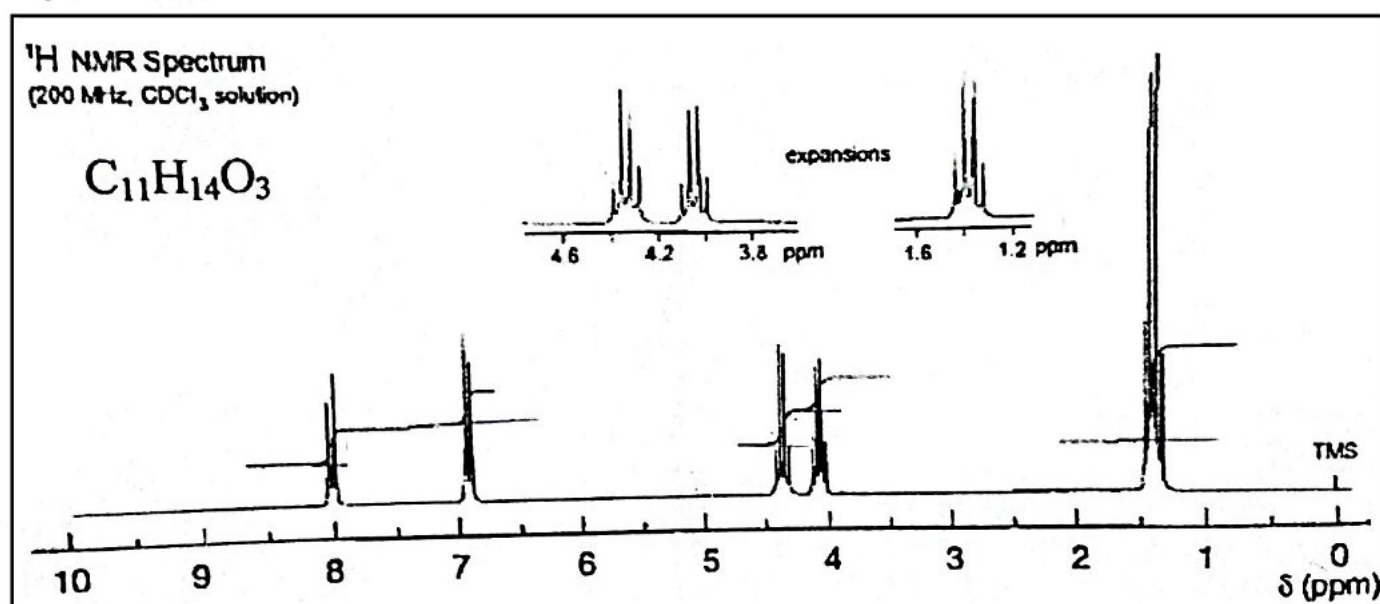




Spectre 16



Spectre 17





Spectre 17

