

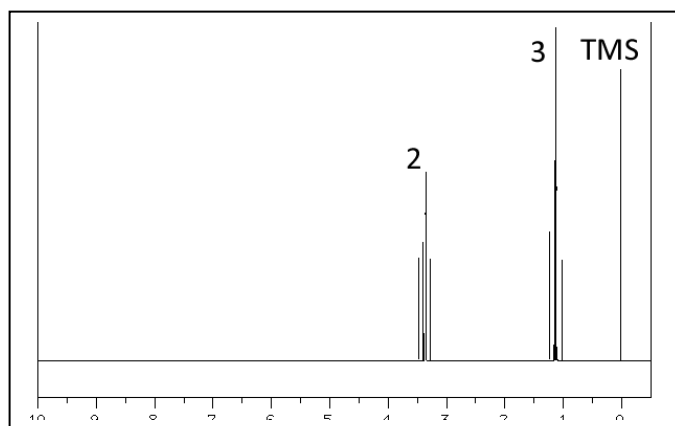
Lesson 3 ^1H NMR

- 1) A compound has the molecular formula $\text{C}_4\text{H}_{10}\text{O}$. Its ^1H NMR spectrum is shown on the right. Students were given this information and asked to identify the compound.

a) How many non-equivalent hydrogens exist.

b) A student offered the following possible compounds.

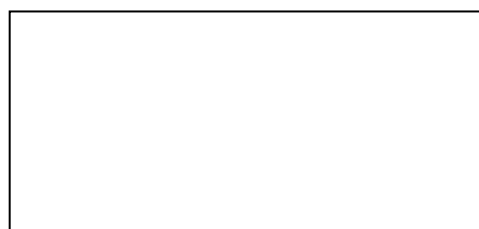
- i. butan-2-ol
- ii. 2-methylpropan-1-ol
- iii. 1-butanol
- iv. 2-methylpropan-2-ol



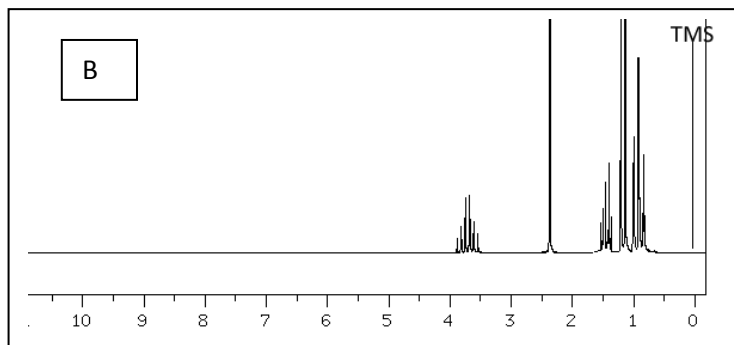
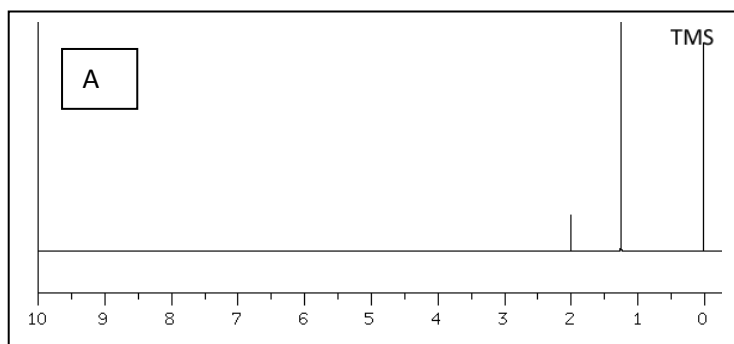
Draw the structural formulae of the compounds and give a reason why each compound is or is not represented by the spectrum above.

butan-2-ol	2-methylpropan-2-ol	butan-1-ol	2-methylpropan-1-ol
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c) Draw the structural formula of the compound represented by the ^1H NMR spectrum above.

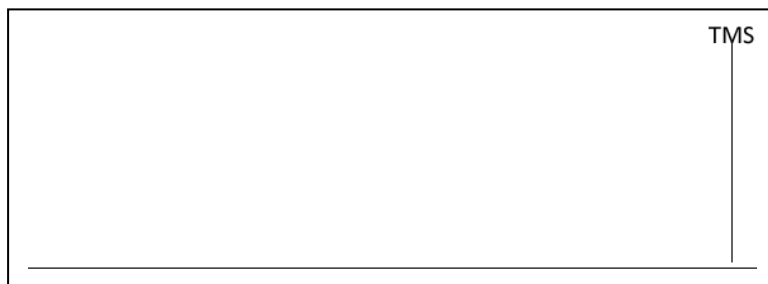


- 2) The two spectra below, belong to two of the compounds listed above. Identify the compounds

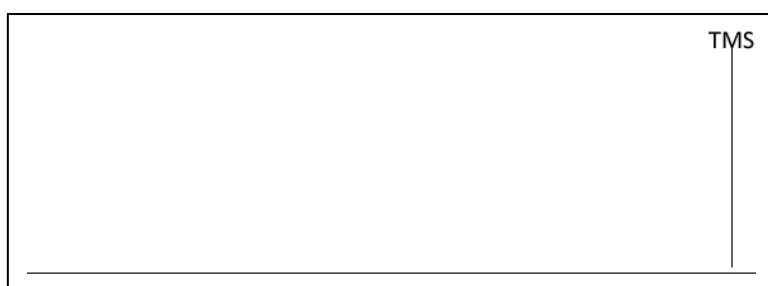


- 3) On the set of axes below draw the possible splitting patterns in their relative order to form a ^1H NMR spectrum. Predict the area under each peak for each spectrum.

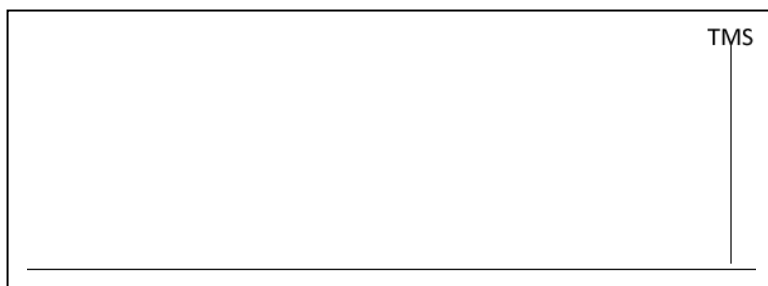
a) 1-bromoethane



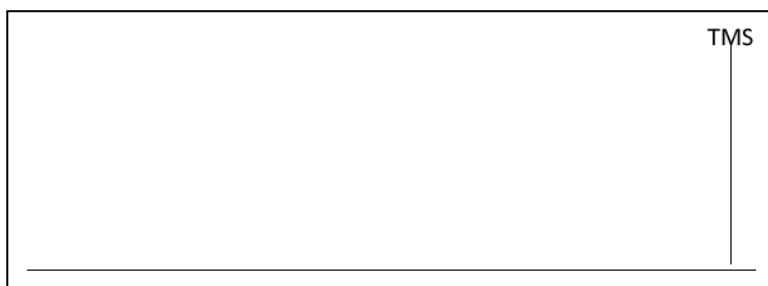
b) 1-chloropropane



c) 1,1,2-trichloroethane



d) 2-methyl-1-propanol



e) methyl ethanoate

