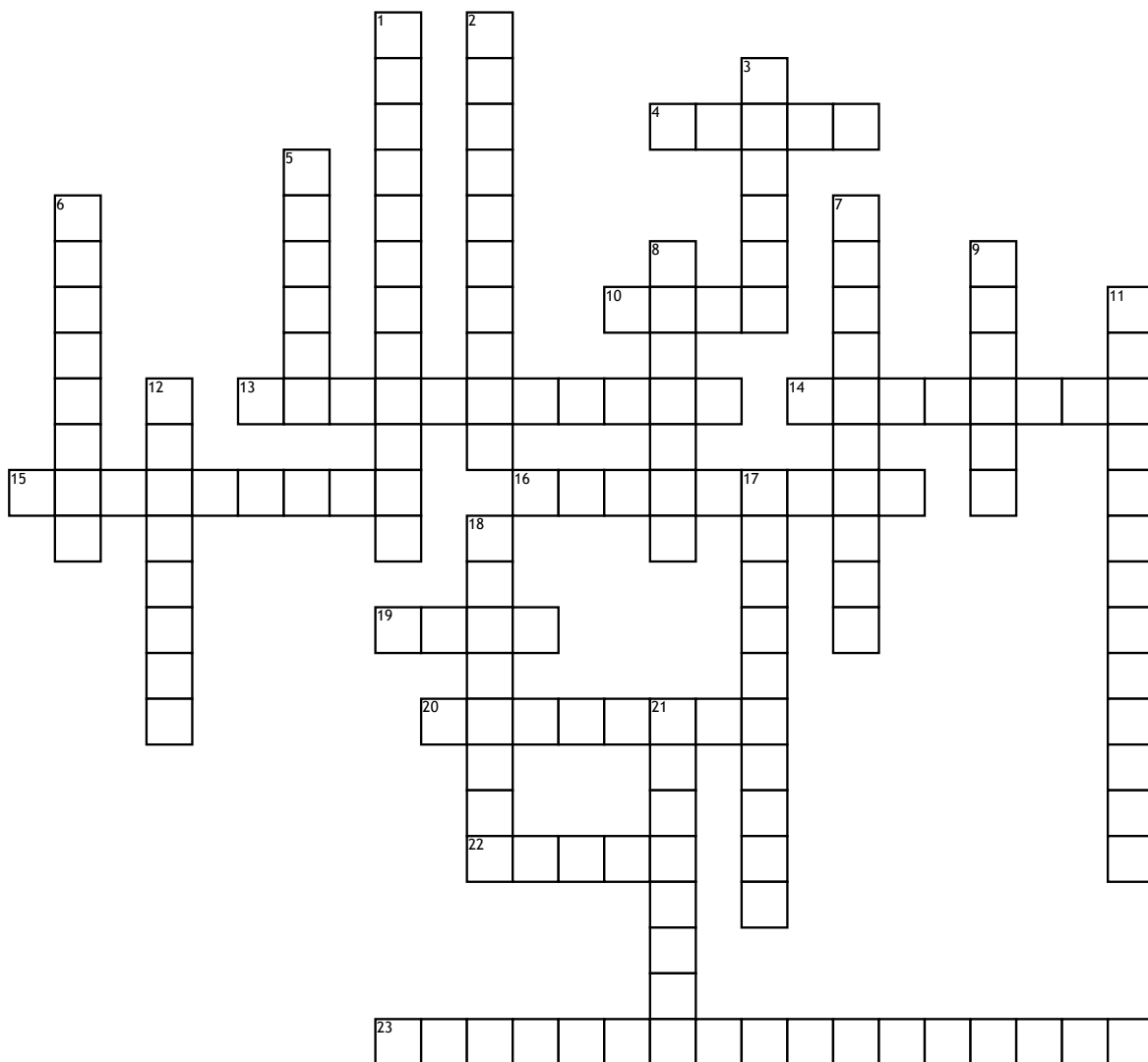


NMR Spectroscopy Crossword



Across

4. Primary alkyls have a ___ chemical shift on both carbon and proton NMR.

10. Typically, only nuclei with a ___ of $\frac{1}{2}$ are observed.

13. What allows the measurement of the relative intensity of the signals in this spectrum?

14. When hydrogen atoms align with the applied magnetic field, it is lower in energy, therefore having a ___ nuclear spin value.

15. The resonance frequency for TMS is defined as the ___. (4, 5)

16. Higher electron density creates ___ around the nucleus. This signal appears further upfield in ^1H NMR spectroscopy.

19. Shielded hydrogens require ___ applied magnetic field, B_0 , to flip the spin?

20. When hydrogen atoms align against the applied magnetic field, it's higher in energy, therefore having a ___ nuclear spin value.

22. NMR uses a higher wavelength than IR, which equates to a ___ energy spectroscopy.

23. The internal standard used in carbon and proton NMR is ___.

Down

1. NMR spectrometry identifies carbon or hydrogen items within different ___.

2. What appears as a small singlet at 7.26ppm on a proton NMR?

3. Which type of NMR spectroscopy (proton or carbon) usually requires more time to attain results.

5. ^1H is one of the most ___ nuclei in organic molecules.

6. Less ___ bonding within the molecule results in a lower chemical shift.

7. In ^{13}C NMR, a small signal can indicate the presence of a ___ carbon.

8. A higher frequency occurs when the applied magnetic field and the induced magnetic field are ___ to each other.

9. In which form of NMR (proton or carbon) can multiplicity be utilised for further data analysis?

11. The ___ of ^{13}C NMR ranges between 0-200ppm, whilst that of ^1H NMR is between 0-10ppm.

12. Which type of hydrocarbon tends to appear within the region of 6.5 to 8.5ppm on a proton NMR?

17. ___ hydrogens appear further down field of the TMS signal in ^1H NMR.

18. In ^1H NMR, the hydrogen of which functional group typically appears at 12ppm?

21. Electronegative functional groups tend to ___ the chemical shift.