

5.1: Chapter Objectives and Preview of Nuclear Magnetic Resonance Spectroscopy

Objectives

After completing this chapter, you should be able to

- fulfill all of the detailed objectives listed under each individual section.
- solve road-map problems which may require the interpretation of ^1H NMR spectra in addition to other spectral data.
- define, and use in context, the key terms introduced in this chapter.

In the previous chapter, it was discussed that Infrared (IR) Spectroscopy gives information about the functional groups present in a molecule. Nuclear Magnetic Resonance (NMR) is another type of absorption spectroscopy similar to Ultraviolet-Visible spectroscopy (UV) or IR spectroscopy. In the presence of a magnetic field, a sample can absorb electromagnetic radiation, specifically in the radiofrequency (rf) region, based on the function of certain nuclei in the molecule. For organic chemists, NMR spectroscopy is an invaluable resource for determining the structure of molecules and often used first when analyzing a molecule. NMR spectroscopy complements IR spectroscopy because information on the hydrocarbon portion of the molecule can be obtained as well as additional information about the functional groups.

This chapter will focus on proton nuclear magnetic spectroscopy (^1H NMR). To start, some basic theory behind this technique will be discussed, followed by what type of information you can glean from spectra and finishing with interpretation of an NMR spectrum for the determination of a structure of a molecule.

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