

2.1: Chapter Objectives and Preview of Mass Spectrometry

Learning Objectives

After completing this chapter, you should be able to

- fulfill all of the detailed objectives listed under each individual section.
- solve fragmentation problems which may require the interpretation of mass spectrometry.
- define, and use in context, the key terms introduced in this chapter.

Every time a reaction is run, the products must be identified. Every time a new molecule is found in nature, its structure must be determined. After reading this chapter and the following chapters, you will have an idea of what techniques are used to elucidate structures as well as how and when to use them. The powerful techniques used for structure determination are mass spectrometry (MS), ultraviolet spectroscopy (UV), infrared spectroscopy (IR), and nuclear magnetic spectroscopy (NMR). Want to know the size and formula of the molecule - use mass spectrometry. Does the molecule have a conjugated pi-system? Ultraviolet spectroscopy will help identify those. Need to determine the functional groups present, then turn to infrared spectroscopy. Looking to piece together the framework of the molecule, then look no further than nuclear magnetic spectroscopy.

In this chapter, the focus will be on mass spectrometry. In short, mass spectrometry is a way to determine the molecular weight of a molecule. In the process, it can give insight into the structure of the molecule by the fragment sizes formed. This chapter will begin to introduce the techniques used to determine the structure of organic molecules, starting with mass spectrometry.

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