

CHAPTER OVERVIEW

11: INFRARED SPECTROSCOPY AND MASS SPECTROMETRY

Learning Objectives

After reading this chapter and completing ALL the exercises, a student can be able to

- correlate regions of the electromagnetic spectrum to spectroscopic techniques - refer to section 11.1
- explain how an IR spectrometer works and the IR region interacts with organic compounds - refer to section 11.2
- explain the role of asymmetry in IR absorption - refer to section 11.3
- interpret IR spectra - refer to section 11.4, 11.5, and 11.6
- explain how a mass spectrometer works - refer to section 11.7
- explain the source of the base peak and molecular ion in a mass spectrum - refer to section 11.7
- correlate bond strength to fragmentation patterns - refer to section 11.8
- use fragmentation patterns to elucidate structural features of organic compounds - refer to section 11.9
- explain how high-resolution mass can be used to determine chemical formulas - refer to section 11.10

[11.1: The Electromagnetic Spectrum and Spectroscopy](#)

[11.2: Infrared \(IR\) Spectroscopy](#)

[11.3: IR-Active and IR-Inactive Vibrations](#)

[11.4: Interpreting IR Spectra](#)

[11.5: Infrared Spectra of Some Common Functional Groups](#)

[11.6: Summary and Tips to Distinguish between Carbonyl Functional Groups](#)

[11.7: Mass Spectrometry - an introduction](#)

[11.8: Fragmentation Patterns in Mass Spectrometry](#)

[11.9: Useful Patterns for Structure Elucidation](#)

[11.10: Determination of the Molecular Formula by High Resolution Mass Spectrometry](#)

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