

1. What is the primary interaction of molecules with light?
 - A. Electron spin
 - B. Vibrational energy
 - C. Rotational energy
 - D. Photon absorption

2. Which of the following is NOT a type of light?
 - A. Ultraviolet
 - B. Microwave
 - C. Radio
 - D. Infrared

3. What is the primary difference between infrared and ultraviolet light?
 - A. Infrared light has a longer wavelength than ultraviolet light.
 - B. Ultraviolet light has a shorter wavelength than infrared light.
 - C. Infrared light has a higher frequency than ultraviolet light.
 - D. Ultraviolet light has a higher frequency than infrared light.

4. How do molecules absorb light?
 - A. By increasing their vibrational energy
 - B. By increasing their rotational energy
 - C. By decreasing their vibrational energy
 - D. By decreasing their rotational energy

5. What is the primary difference between absorption and emission spectra?
 - A. Absorption spectra show the wavelengths of light that are absorbed by a molecule.
 - B. Emission spectra show the wavelengths of light that are emitted by a molecule.
 - C. Absorption spectra show the frequencies of light that are absorbed by a molecule.
 - D. Emission spectra show the frequencies of light that are emitted by a molecule.

6. How do molecules emit light?
 - A. By increasing their vibrational energy

- B. By increasing their rotational energy
- C. By decreasing their vibrational energy
- D. By decreasing their rotational energy

7. What is the primary difference between absorption and emission spectroscopy?

- A. Absorption spectroscopy measures the amount of light absorbed by a molecule.
- B. Emission spectroscopy measures the amount of light emitted by a molecule.
- C. Absorption spectroscopy measures the wavelength of light absorbed by a molecule.
- D. Emission spectroscopy measures the wavelength of light emitted by a molecule.

8. What is the primary difference between infrared and ultraviolet spectroscopy?

- A. Infrared spectroscopy measures the amount of light absorbed by a molecule.
- B. Ultraviolet spectroscopy measures the amount of light emitted by a molecule.
- C. Infrared spectroscopy measures the wavelength of light absorbed by a molecule.
- D. Ultraviolet spectroscopy measures the wavelength of light emitted by a molecule.

9. How can the absorption or emission spectra of a molecule be used to determine its structure?

- A. By comparing the spectra to known spectra
- B. By comparing the spectra to the molecule's structure
- C. By using the spectra to calculate the molecule's structure
- D. By using the spectra to determine the molecule's function

10. What is the primary difference between a mass spectrometer and an infrared spectrometer?

- A. A mass spectrometer measures the mass of a molecule.
- B. An infrared spectrometer measures the infrared absorption of a molecule.
- C. A mass spectrometer measures the infrared absorption of a molecule.
- D. An infrared spectrometer measures the mass of a molecule.

11. What is the primary difference between a nuclear magnetic resonance spectrometer and an ultraviolet spectrometer?

- A. A nuclear magnetic resonance spectrometer measures the nuclear magnetic resonance of a molecule.

- B. An ultraviolet spectrometer measures the ultraviolet absorption of a molecule.
- C. A nuclear magnetic resonance spectrometer measures the ultraviolet absorption of a molecule.
- D. An ultraviolet spectrometer measures the nuclear magnetic resonance of a molecule.

12. What is the primary difference between a nuclear magnetic resonance spectrometer and a mass spectrometer?

- A. A nuclear magnetic resonance spectrometer measures the nuclear magnetic resonance of a molecule.
- B. A mass spectrometer measures the mass of a molecule.
- C. A nuclear magnetic resonance spectrometer measures the mass of a molecule.
- D. A mass spectrometer measures the nuclear magnetic resonance of a molecule.

13. What is the primary difference between an infrared spectrometer and a nuclear magnetic resonance spectrometer?

- A. An infrared spectrometer measures the infrared absorption of a molecule.
- B. A nuclear magnetic resonance spectrometer measures the nuclear magnetic resonance of a molecule.
- C. An infrared spectrometer measures the nuclear magnetic resonance of a molecule.
- D. A nuclear magnetic resonance spectrometer measures the infrared absorption of a molecule.

14. What is the primary difference between an ultraviolet spectrometer and a nuclear magnetic resonance spectrometer?

- A. An ultraviolet spectrometer measures the ultraviolet absorption of a molecule.
- B. A nuclear magnetic resonance spectrometer measures the nuclear magnetic resonance of a molecule.
- C. An ultraviolet spectrometer measures the nuclear magnetic resonance of a molecule.
- D. A nuclear magnetic resonance spectrometer measures the ultraviolet absorption of a molecule.

15. What is the primary difference between an ultraviolet spectrometer and an infrared spectrometer?

- A. An ultraviolet spectrometer measures the ultraviolet absorption of a molecule.
- B. An infrared spectrometer measures the infrared absorption of a molecule.
- C. An ultraviolet spectrometer measures the infrared absorption of a molecule.

D. An infrared spectrometer measures the ultraviolet absorption of a molecule.

Answer Key:

1. D
2. C
3. B
4. A
5. A
6. C
7. A
8. A
9. A
10. B
11. B
12. B
13. A
14. B
15. A