# UV-Vis, FT-IR, Raman Spectroscopy

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UV-Vis, FT-IR, Raman Spectroscopy M5052 - Characterization of Materials & Nanomaterials

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**Questions (22)** Hide answers

1 - Quiz

**What is Vibrational Spectoscopy?**

20 sec

- A method to identify compounds based on the vibrations of functional groups ✓
- Absorption of light by solids ✗
- UV-Vis and FT-IR Spectroscopy ✗
- Transmission of light by solids ✗

2 - Quiz

**Which of the following best describes the process of absorption of light by**

Photons are emitted by excited states ✗

The photon energy changes with absorption ✗

Photons promote electrons to higher energy levels ✓

Energy of photons is unchanged by materials ✗

3 - Quiz

**From low to high energy, what is the correct order of regions in the electromagnetic spectrum?**

20 sec

Ultraviolet, Visible, Infrared, X-Rays ✗

Infrared, visible, ultraviolet, X-Rays ✓

X-rays, UV, Visible, Infrared ✗

Visible, ultraviolet, infrared, X-Rays ✗

4 - Quiz

**The following is and advantage of Fourier Transform Infrared over conventional IR**

20 sec

It detects more vibrational modes ✗

Does not require a monochromator ✓

It does not required calibration ✗

5 - Quiz

**Why UV-Vis spectra present broad absorption bands?**

20 sec

Most samples absorbe at several wavelenghts at the same time ✓

Detectors in UV-Vis are not very powerful ✗

Samples are very concentrated ✗

Samples are contaminated ✗

6 - Quiz

**Chose the statement that is FALSE about UV-Vis Spectroscopy**

20 sec

It's more useful for quantification than for qualitative analysis ✗

Only works for samples in solution ✓

Energy of photons in UV-Vis range is not large enough to break bonds ✗

7 - True or False

**A colorimeter is a form of UV-Vis Spectrometer**

20 sec

True ✓

False ✗

8 - True or False

**If a solution looks transparent to the eye, it will show no peaks in a UV-Vis spectrum**

20 sec

True ✗

False ✓

9 - True or False

**Solvent effects can change position and shape of absorption bands in UV-Vis**

20 sec

True ✓

10 - True or False

**The wavelength of maximum absorption in UV-Vis depends on the difference in energy between the ground and excited state**

20 sec

- True ✓
- False ✗

11 - Quiz

**What kind of samples can NOT be analyzed by FT-IR Spectroscopy?**

20 sec

- Liquids deposited over a salt window ✗
- Nanoparticles and nanostructured nanomaterials on their own ✗
- Nanoparticles and powders over a glass substrate ✓
- A gas in a closed cell or flowing cell in transmission mode ✗

12 - Quiz

**Choose the statement that is TRUE about FT-IR spectroscopy**

20 sec

It's mostly a quantitative technique ✗

Typically uses the far infrared part of the spectrum ✗

Provides information of organic functional groups present in a sample ✓

13 - Quiz

**The following figure shows an incorrect FT-IR spectrum beause:**

20 sec

Its plotted backwards ✓

Spectra are not aligned ✗

Sample has humidity shown by the broad peak at 3500 $cm^{-1}$ ✗

$CO_2$ peak was not removed ✗

14 - True or False

**The relative intensity of peaks in FT-IR depend on how many of those bonds are present in the sample**

20 sec

True ✓

15 - True or False

**A single characteristic peak in an FTIR spectrum is enough to confirm the presence of a compound**

20 sec

| | |
|---|---|
| True | ✗ |
| False | ✓ |

16 - True or False

**FTIR is mostly used for organic materials, but it can give information about some inorganic substances**

20 sec

| | |
|---|---|
| True | ✓ |
| False | ✗ |

17 - True or False

**The Attenuated Total Reflectance (ATR) in FTIR accessory allows to analyze opaque and dark samples, including liquids**

20 sec

| | |
|---|---|
| True | ✓ |
| False | ✗ |

20 sec

| | |
|---|---|
| Samples must absorb photons | ✗ |
| Photons interact exclusively with excited electronic states | ✗ |
| Photons produce scattering due to Stocks and anti-stocks transitions | ✓ |
| Light is transmitted through a thin sample | ✗ |

19 - Quiz

**What is the angle of the position of the detector with respect to the sample in Raman spectroscopy?**

20 sec

| | |
|---|---|
| 45° | ✗ |
| 90° | ✓ |
| 180° | ✗ |
| 270° | ✗ |

20 - True or False

**Anti-Stokes scattered photons have more intense signals than the Stokes Scattered photons**

20 sec

False ✓

21 - True or False

**Raman spectroscopy can be used to analyze inorganic materials**

20 sec

True ✓

False ✗

22 - Quiz

**Are advantages of Raman over FT-IR Spectroscopy**

20 sec

Cheaper, easier, simpler ✗

Water, glass and quartz do not interfere ✓

Does not require to be calibrated often ✗