

## FUNCTIONS OF FOURIER TRANSFORM INFRARED FT/IR-4600 SPECTROMETER

*Mambetov Abbas*

*Urganch State University 2nd year master,*

*Usmanov Rasul*

*Urganch State University docent,*

*Ataullayev Zakir*

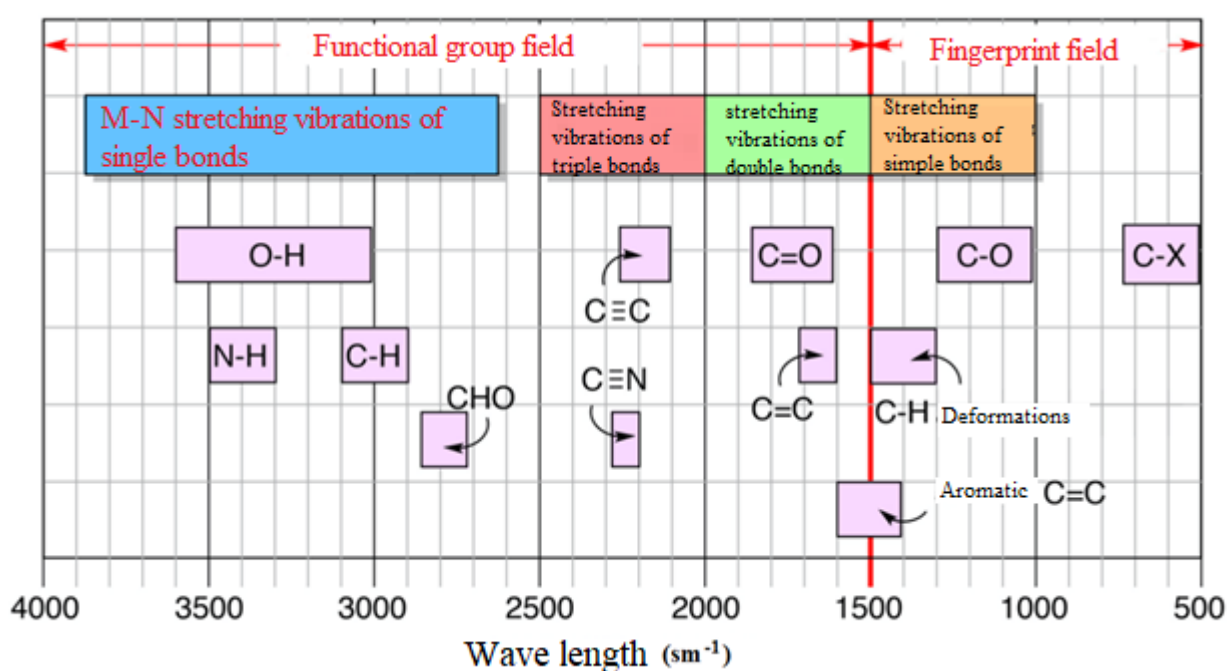
*Urganch State University docent of Chemistry Department*

*[azokir16@mail.ru](mailto:azokir16@mail.ru)*

In organic chemistry, infrared (IS) spectroscopy is often used to identify functional groups present in a molecule. Each of the classes of organic compounds is distinguished by the presence of a characteristic functional group in the molecule. For example, all alcohols contain an O-H hydroxyl group attached to an  $sp^3$  hybridized carbon atom [1]. Alkenes have a carbon-carbon double bond ( $C=C$ ), and ketones have a carbon-oxygen double bond (carbonyl group  $C=O$ ).

In fact, IR spectroscopy can be considered as a detector of functional groups of organic compounds. These are. The quickest and easiest way to determine the presence of one of these functional groups is to record the IR spectrum of the compound. The technique is simple and can often provide an accurate answer in less than a minute.

When interpreting an IR spectrum, we can use the diagrams shown in Figure 1 to pick out the absorption bands that correspond to the different functional groups in the molecule.



**Figure 1. absorption fields of organic groups**

A series of steps must be followed to perform a measurement using the [Spectra Measurement] function on the FT/IR-4600 spectrometer [2]. Basically, three types of measurement methods are recommended.

We recommend choosing and using one of them depending on the type of substance to be detected in the IR spectrometer and your goal.

1. Measurement with a standard mirror:
2. Measurement with a full function window:
3. Measurement with simplified quick start

In the Spectra Measurement window of the program, there are buttons with the same names for all three functions. It should be noted that several measuring programs cannot be launched at the same time.

Measurement with a standard window: Measurement of spectra, data storage and printing are carried out with the help of polystyrene film. Here is a series of measurements shown with only the data panel displayed. A measurement sequence is performed using the zoom panel, thumbnail panel, or results panel.

In order to set parameters, [Measure]-[Parameters] is set from the menu. The details of setting parameters are set according to Table 1.

**Table 1  
Dimensions**

Standard		Optics		FFT/Timer	
Number of scans	16	Source	Standard	Apodization function	Cosine
Resolution	4 cm <sup>-1</sup>	Detector	TGS	Zero filling	ON
Measure range	4000-400	Sample chamber	Standard	Phase correction	Mertz
View Range	4000-400	Gain	Auto	Phase correction filter	Auto
Vertical axis: Sample	%T	Aperture	Auto	Use timer	OFF
Vertical axis Background	Single	Scan speed	Auto	Repeat measurement	OFF
		Filter	Auto		
Data processing					
Data	ON				

Full-Function Window Measurement: The basic measurement sequences explained here in Standard Window Measurement Procedures, as well as a series of measurements using the various functions of the Sketch panel, Zoom panel, Results panel, etc. It is intended to carry out measurement sequences that carry out

measurements. When the real-time data processing function is installed, data processing is carried out automatically during the measurement or after the measurement is completed. In addition, the unprocessed raw data and simultaneously processed corrected data can be saved automatically.

A polystyrene film is used as a standard accessory for the sample. "Measurement sequence with quick start" is activated for regular data processing with the START key for the main measurement sequence

### References

1. Тонков М.В., Фурье-спектроскопия – максимум информации за минимум времени. 2001. 76 с.
2. Fourier Transform Infrared FT/IR-4600 series instruction manual "Jasco" 2018 160 с

