

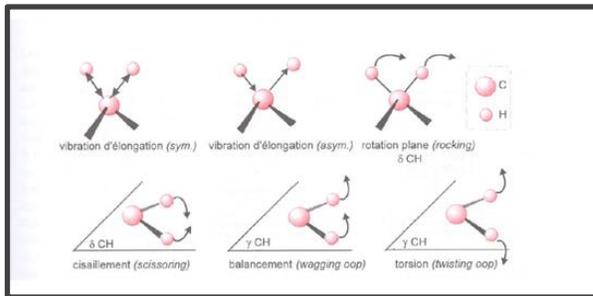
FTIR TECHNIQUE



The Fourier transform infrared spectroscopy (FTIR) is a technique used to obtain the absorption spectrum, the emission spectrum, the photoconductivity or Raman scattering of the infrared of solid, liquid or gaseous sample. This technique allows defining the nature of the chemical bonds in a molecule in order to determine its nature. Widely used to identify organic impurities in the microelectronics industry, this technique is also used for the identification of organic material.

Analytical Services

FTIR technique uses the chemical bonds vibration frequency to identify the studied molecule. The sample is subjected to electromagnetic radiation in the infrared range of length between 2.5 microns and 50 microns. The electric field induced by the electromagnetic wave can interact with a dipole moment of a molecular entity present in the material. When the field frequency coincides with the frequency of vibration of a specific mode of the molecule, the resulting interaction generates the vibration of certain



bonds and the energy absorption of the corresponding excitation wavelength. The frequency at which the radiation is absorbed depends on the nature of the bonds, the mass of the atoms involved and the immediate environment of the treated group. Diatomic molecules have only one link, which can be stretched. The most complex molecules have many bonds, and vibration may be

combined, leading to the infrared absorption at the characteristic frequencies which can be linked to chemical groups. For example, the atoms of CH₂, is commonly found in organic compounds can vibrate in six different ways: symmetric and antisymmetric stretching, shear, rocking, shaking and out of plane twisting.

The resulting signal is Fourier transformed to provide the compound of the interferogram which identifies the different characteristic absorption bands of the tested material. By comparing this spectrum with a database, it is possible to identify the nature of the analyzed compound.

