

# Gas Chromatography / Mass Spectrometry (GC- MS)



MAKE	MODEL
Perkin Elmer,	Autosystem XL GC+

## Small Description:

**GC-Mass Spectrometer** Perkin Elmer Turbomass Mass range: upto 1200 amu; Programmable pneumatic control for carrier gas flow regulation; NIST Mass spectra library Separation/identification of organic/ organometallic compounds and molecules; EI, CI modes of operation.

- ❖ GC-MS mainly consists of a regular Perkin Elmer Auto System XL Gas Chromatograph and final stage as mass spectrometer.
- ❖ Mass spectrometry is a method to separate the ions or atoms of a compound by their mass.
- ❖ This is achieved by ionizing the sample molecules and accelerating them by electric field. These charged particles are then introduced to magnetic field where they tend to deflect to different angles according to their mass(m) to charge(z) ratio (m/z). This will reveal mass spectra of the sample.
- ❖ There are various techniques to achieve ionization like
- ❖ GC-MS uses Electron Ionization (EI), Chemical Ionization(CI) since it has the capability to perform positive ionization and negative ionization for molecular weight information of more complex samples.
- ❖ Mass spectra is useful to confirm the atomic structure of known compound by comparing the achieved spectra with standard data.
- ❖ Probable structure of unknown compound can be predicted when results of GC-MS, IR and NMR are combined
- ❖ It is very sensitive instrument, and can detect upto picogram level masses. The mass range is 2-1200 Da, which allows analysis over a wide range of low and high molecular weight compounds.

Specifications:

- ❖ Analyzer: Quadrupole with prefilter
- ❖ Mass Range: 2-1200 Daltons (amu)
- ❖ Mass Stability:  $\pm 0.1$  m/z mass accuracy over 48 hours
- ❖ Ionization Modes: EI, Positive / Negative Chemical Ionization.
- ❖ Vacuum Pump: Turbo molecular pump 250L/Sec.
- ❖ Software: Turbo Mass

Applications:

- ❖ Environmental, Flavors, Fragrances, Forensic, Pharmaceuticals, Organic, Chemical Manufacturing. Petrochemicals
- ❖ Nominal Molecular weight calculation
- ❖ Molecular structure
- ❖ Isotopic abundance can be measured
- ❖ Impurities in drinking water, waste water, air and other gases
- ❖ Used to detect elements like chlorine, bromine, sulfur, silicon, boron in nanogram levels.