

Gas chromatography-mass spectrometry (GC-MS) is a method that combines the features of gas-liquid chromatography and mass spectrometry to identify different substances within a test sample. Applications of GC-MS include drug detection, environmental analysis, explosives investigation, and identification of unknown volatile samples. Additionally, it can identify trace elements in materials that were previously thought to have disintegrated beyond identification. The GC-MS is composed of two major building blocks: the gas chromatograph and the mass spectrometer. The gas chromatograph utilizes a capillary column which depends on the column's dimensions (length, diameter, film thickness) as well as the phase properties (e.g. 5% phenyl polysiloxane). The difference in the chemical properties between different molecules in a mixture will separate the molecules as the sample travels the length of the column. The molecules take different amounts of time (called the retention time) to come out of (elute from) the gas chromatograph, and this allows the mass spectrometer downstream to capture, ionize, accelerate, deflect, and detect the ionized molecules separately. The mass spectrometer does this by breaking each molecule into ionized fragments and detecting these fragments using their mass to charge ratio. The most common type of mass spectrometer (MS) associated with a gas chromatograph (GC) is the quadrupole mass spectrometer, sometimes referred to by the Hewlett-Packard (now Agilent) trade name "Mass Selective Detector" (MSD). Another relatively common detector is the ion trap mass spectrometer.

The GC-MS assembly is manufactured and marketed by many companies like Agilent, Shimadzu, Perkin Elmer, Thermo Fischer.

An Agilent GC-MS was purchased in IIT-Kanpur under the project CARE-2007. The main features of the instrument are as follows,

1. The GC has MSD interface and can be run in split or splitless mode. It has a three way splitter which enables the simultaneous detection by three detectors for analysis, i.e. Micro ECD, NPD with EPC and MS.
2. Autoinjector with 8 vials capacity.
3. Columns: DB-5/HP-5, DB-Wax, DB-1701, DB-35MS.
4. NIST and Wiley library.

Users have to pay a minimum of Rs 2000 for a single slot. Each slot is of 5 hour duration. The timings are 0800-1300; 1330- 1830 hrs on all working days. For single samples also the cost will be the same.

The Location of the instrument and contact information is given below

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