

9.2.2 Terms Related to the Chromatographic System

9.2.2.1 Apparatus in Column Chromatography

Pump

A device designed to deliver the mobile phase at a controlled flow-rate to the separation system. Pumps are generally used in liquid chromatography.

Syringe Pumps

Pumps with a piston, which advances at a controlled rate within a smooth cylinder to displace the mobile phase.

Reciprocating Pumps

Pumps with a single or multiple chamber, from which the mobile phase is displaced by reciprocating piston(s) or diaphragm(s).

Pneumatic Pumps

Pumps which employ a gas to displace the liquid mobile phase either directly or via a piston.

Sample Injector

A device by which a liquid, solid or gaseous sample is introduced into the mobile phase or the chromatographic bed.

Direct Injector

A device which directly introduces the sample into the mobile-phase stream.

Bypass Injector

A device in which the sample is first introduced into a chamber (loop), temporarily isolated from the mobile phase system by valves, which can be switched to make an instantaneous diversion of the mobile phase stream through the chamber to carry the sample to the column. A bypass injector may also be known as a *Valve Injector* or *Sampling Valve* (see *Gas Sampling Valve*).

On-Column Injector

A device in which the sample is directly introduced into the column. In gas chromatography the on-column injector permits the introduction of the liquid sample into the column without prior evaporation.

Flash Vaporizer

A heated device used in gas chromatography. Here the liquid sample is introduced into the carrier gas stream with simultaneous evaporation and mixing with the carrier gas prior to entering the column.

Split Injection

A sample introduction technique used in gas chromatography. The sample is flash vaporized and after thorough mixing of the sample with the carrier gas, the stream is split into two portions, one being conducted to the column and the other being discarded.

Programmed Temperature Vaporizer (PTV)

A sample introduction device used in gas chromatography. The liquid sample is introduced, usually with a syringe, into a device similar to a flash vaporizer, the temperature of which is kept low, below the boiling point of the sample components. After withdrawal of the syringe, the device is heated up very rapidly in a controlled fashion to evaporate the sample into the continuously flowing carrier gas stream. The PTV may also be used in the split mode: in this case, the carrier gas stream containing the evaporated sample components is split into two portions, one of which is conducted into the column while the other is discarded.

Gas Sampling Valve

A bypass injector permitting the introduction of a gaseous sample of a given volume into a gas chromatograph.

Column Oven

A thermostatically controlled oven containing the column, the temperature of which (*Separation Temperature* or *Column Temperature*) can be varied within in a wide range.

Fraction Collector

A device for recovering fractional volumes of the column effluent.

Detector

A device that measures the change in the composition of the eluent by measuring physical or chemical properties.