



Standard Practice for Liquid Chromatography Terms and Relationships¹

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This standard has been approved for use by agencies of the U.S. Department of Defense.

1. Scope

1.1 This practice deals primarily with the terms and relationships used in liquid column chromatography. However, most of the terms should also apply to other kinds of liquid chromatography, notably planar chromatography such as paper or thin-layer chromatography.

NOTE 1—Although electrophoresis can also be considered a liquid chromatographic technique, it and its associated terms have not been included in this practice.

1.2 Since most of the basic terms and definitions also apply to gas chromatography, this practice uses, whenever possible, symbols identical to Practice E355.

1.3 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

2. Referenced Documents

2.1 ASTM Standards:²

D3016 Practice for Use of Liquid Exclusion Chromatography Terms and Relationships

E355 Practice for Gas Chromatography Terms and Relationships

E1151 Practice for Ion Chromatography Terms and Relationships

3. Names of Techniques

NOTE 2—In the chromatographic literature one may often find the term high-performance (or high-pressure) liquid chromatography, abbreviated as HPLC. This term was introduced to distinguish the present-day column chromatographic techniques employing high inlet pressures and columns containing small diameter packing from the classical methods. The utilization of this term or any derivative term (for example, HPLSC for high-performance liquid-solid chromatography) is not recommended.

Similarly, the use of the term high-performance thin-layer

chromatography, abbreviated as HPTLC, describing newer variations of thin-layer chromatography, is also not recommended.

3.1 *Liquid Chromatography*, abbreviated as LC, comprises all chromatographic methods in which the mobile phase is liquid under the conditions of analysis. The stationary phase may be a solid or a liquid supported by or chemically bonded to a solid.

3.2 The stationary phase may be present on or as a plane (*Planar Chromatography*), or contained in a cylindrical tube (*Column Chromatography*).

3.3 Separation is achieved by differences in the distribution of the components of a sample between the mobile and stationary phases, causing them to move along the plane surface or through the column at different rates (differential migration).

3.3.1 In *Planar Chromatography*, the differential migration process will cause the sample components to separate as a series of spots behind the mobile phase front.

3.3.2 In *Column Chromatography*, the differential migration process will cause the sample components to elute from the column at different times.

3.3.3 In *Dry-Column Chromatography*, mobile phase flow is stopped as soon as the mobile phase has reached the end of the column of dry medium. This column can be glass or a rigid or flexible solvent compatible plastic. Solute visualization and recovery are from the extruded or sliced column packing.

3.3.4 In *Flash Chromatography*, mobile phase flow is continued after the mobile phase has reached the end of the column of dry medium until elution of the desired components is achieved. Often low pressures, compatible with the materials of construction of the column, are applied to the top of the column to speed up the elution.

3.4 The basic process of selective distribution during the chromatographic process can vary depending on the type of stationary phase and the nature of the mobile phase.

3.4.1 In *Liquid-Liquid Chromatography*, abbreviated LLC, the stationary phase is a liquid and the separation is based on selective partitioning between the mobile and stationary liquid phases.

3.4.2 In *Liquid-Solid Chromatography*, abbreviated as LSC, the stationary phase is an interactive solid. Depending on the

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.